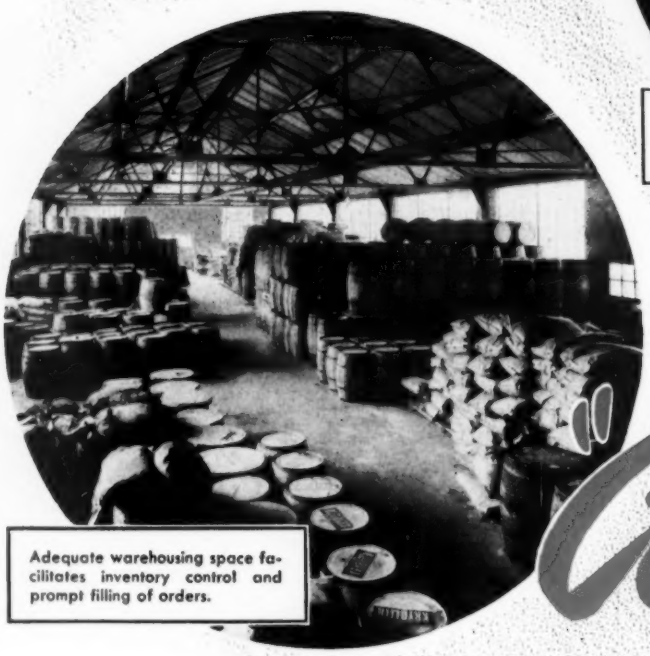
finish
May · 1952
METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

CHEMICAL SHORTAGES mean REDOUBLED EFFORTS.....

Chemical processing on a large scale requires large reaction equipment.



Adequate warehousing space facilitates inventory control and prompt filling of orders.

by "Ceramic"

Your problems are our problems. In times of shortages especially, we put forth every effort to meet the needs of those who have depended on us in more normal times.

We are doing everything possible to maintain sufficient inventories of essential chemicals to keep our customers' production lines moving. When such chemicals are not available in usable form, we are testing and processing available material to produce them.

"Ceramic" quality is guaranteed . . . there will be no let-down in the rigid quality control or testing under operating conditions that every "Ceramic" product must meet.

CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.

WENNING CERAMIC COLORS TRADE MARK

ADS OUT

what's going on here?

Titanox titanium dioxide, for one thing. It's going on more products, for home, industry, business and personal use, than ever before. As a part of the finish, it's giving new life to colors, making whites whiter, adding hiding power and durability.

For the organic finishing field—paints, enamels and lacquers—Titanox has developed rutile titanium dioxide pigments that provide new levels of brightness, opacity and fade-chalk resistance. These pigments are TITANOX-RA, TITANOX-RA-50 and TITANOX-RA-NC.

For the porcelain enamel field, non-pigmentary Titanox titanium dioxide has been developed. Specially processed for ceramic use, TITANOX-TG or, for blue-whites TITANOX-TG-400, assure color uniformity, afford greater production speed and economy . . . superior titania porcelain enamels.

Our Technical Service Department is willing any time to help manufacturers of finishes to make the best use of Titanox titanium dioxide pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

9892

®TITANOX

brightest name in the finish

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

Wherever it's
HOT
specify
Sicon

NEW IMPROVED SILICONE-BASE HEAT-RESISTANT FINISH

Protects Stewart Warner's New Saf-Aire Wall Furnace

Quality finish specifications for this heating unit called for a coating that would stand 500° and still retain its color and gloss—a temperature far above that incurred in normal operation. Ordinary heat resistant coatings failed. SICON *Ivory* and SICON *Beige* worked perfectly...just as SICON has solved so many other finish problems. *Write for dynamic proof of SICON'S amazing stability under heat! New Brochure now ready.*

Sicon
Silicone-Base Finish is manufactured exclusively by
MIDLAND
INDUSTRIAL FINISHES CO.
Waukegan, Illinois
ENAMELS · SYNTHETICS
LACQUERS · VARNISHES

INDUSTRIAL MEETINGS

ELECTROCHEMICAL SOCIETY

The Electrochemical Society, 50th anniversary, Benjamin Franklin Hotel, Philadelphia, May 4-8.

INT'L LIGHTING EXPOSITION

The 4th International Lighting Exposition and Conference, Cleveland Auditorium, Cleveland, Ohio, May 6-9.

LPGA CONVENTION, TRADE SHOW

Liquefied Petroleum Gas Association, convention and trade show, Palmer House, Chicago, May 12-14.

CHICAGO STAMPERS

Chicago District of Pressed Metal Institute, session on "Handling Material in Secondary Operations," May 14, Graemere Hotel.

EASTERN ENAMELERS

Eastern Enamelers Club, dinner meeting, May 17, Philadelphia.

GAS APPLIANCE MFRS. MEETING

Gas Appliance Manufacturers Association, 17th annual meeting, The Broadmoor, Colorado Springs, Colorado, May 21-23.

ENAMELERS MAYPOLE PARTY

Midwest Enamelers Club, annual Maypole Party, Sportsman Golf Club, Chicago, May 23.

ELECTRIC INSTITUTE MEETING

Edison Electric Institute, 20th annual convention, Cleveland, Ohio, June 2-5.

STOVE MFRS. ANNUAL MEETING

The Institute of Cooking and Heating Appliance Manufacturers, 20th annual meeting and exhibit, The Netherland Plaza, Cincinnati, June 2-4.

CHEMICAL INST. OF CANADA

The Chemical Institute of Canada, 35th annual conference and exhibition, Mount Royal Hotel, Montreal, June 2-4.

ELECTROPLATERS MEETING

American Electroplaters Society, 39th annual convention, Conrad Hilton Hotel, and concurrent Industrial Finishing Exposition of 1952, International Amphitheatre, Chicago, June 16-20.

HOMEFURNISHINGS MARKET

International summer Homefurnishings Market, The Merchandise Mart and American Furniture Mart, Chicago, June 16-26.

ASTM 50TH ANNIVERSARY

American Society for Testing Materials, 50th annual meeting, Statler and New Yorker Hotels, New York City, June 23-27.

NAT'L HOUSEWARES EXHIBIT

National Housewares and Home Appliance Manufacturers Exhibits, Auditorium, Atlantic City, N. J., July 7-13.

HOME LAUNDRY MFRS. MEETING

American Home Laundry Manufacturers Association, summer meeting, Mackinac Island, Michigan, July 27-30.

PORCELAIN ENAMEL FORUM

Porcelain Enamel Institute, 14th annual shop practice forum, September 10-12, University of Illinois, Urbana, Illinois.

PMI ANNUAL MEETING

Pressed Metal Institute, annual meeting, Pocono Manor, Pennsylvania, September 14-18.

IRON, STEEL EXPOSITION

Association of Iron and Steel Engineers, 1952 iron and steel exposition, Public Auditorium, Cleveland, Sept. 30 - Oct. 3.

PACKAGING ENGRS. SHOW

Society of Industrial Packaging and Materials Handling Engineers, 7th annual exposition and concurrent short courses, Coliseum, Chicago, October 14-16.

METAL PRODUCTS MANUFACTURING NEWS

A $2,500,000 plant expansion and improvement program is near completion for GENERAL STEEL WARES at Ontario, London, Montreal and Edmonton, Canada, adding 300,000 sq. ft. to the manufacturing and warehousing facilities, and enabling the company to introduce new products.

It is reported that the directors of ARTKRAFT MFG. CORP. and BALTIMORE PORCELAIN STEEL CORP. have approved merger plans, with the new company to be known as UNIVERSAL MAJOR ELECTRIC APPLIANCES, INC., a wholly owned subsidiary of ARTKRAFT. Under the agreement the major appliance business of LANDERS, FRARY & CLARK, including tools, equipment and inventory, would be acquired.

Directors of MAREMONT AUTOMOTIVE PRODUCTS, INC., Chicago, and KALAMAZOO STOVE AND FURNACE CO., Kalamazoo, Mich., approved merger of the two companies. Stockholders are expected to approve the merger at special meetings April 25. The new company would be known as the KALAMAZOO-MAREMONT MANUFACTURING CO., with headquarters in Chicago.

Stockholders of WHIRLPOOL CORPORATION, St. Joseph, Mich., approved a plan to merge with CLYDE PORCELAIN STEEL CORP., Clyde, Ohio. Clyde stockholders approved the plan on March 10. The company will continue to bear the name of WHIRLPOOL CORP.

DEERING AIR CONDITIONING COMPANY, Cincinnati, is introducing the new Deering room air conditioner designed specifically for steel casement windows.

NORGE DIVISION, BORG-WARNER, Chattanooga, Tenn., has named A. F. KOCH as works manager of the corporation's newly formed Wooster Division, Wooster, Ohio. The 104,000 sq. ft. factory, expected to be completed this spring, will produce electrically driven and hydraulic fuel pumps for jet engines.

JOHN WOOD COMPANY has announced the appointment of P. S. LYON as vice president in charge of engineering. WILLIAM T. BRIGGS has been elected vice president of the heater and tank division.

B. F. BIRDWELL has been promoted from General Manager of the Industrial Enameling Division to vice president of INDUSTRIAL ELECTRIC, INC., New Orleans.

ADMIRAL CORPORATION has announced the use of injection molded plastic for inner door liners on their new 12.2 cu. ft., 2-door refrigerators.

LAWNDALE ENAMELING COMPANY, Chicago, has elected EARL P. CALKINS as vice president.

GLOBE AMERICAN CORP., Kokomo, Indiana, has announced the appointments of DEWEY TOBIAS as head of the Tool and Die Department, and CARL DOWNING as Plant Process Engineer.

Washline Gossip

has gone modern too!

Let PEMCO solve your technical problems . . .

Pemco provides a continuing service for the porcelain enameling and ceramic industries. Give our field engineer an opportunity to come in and discuss your shop problems with you. Wire, phone or write today! There's no obligation of course!

"After All, It's the Finish that Counts"

Washday used to be quite a chore for mother, but with modern washing machines and automatic clothes dryers Mondays are no longer blue and forbidding. Today's housewives can gossip about their gleaming white electrical appliances and the wonders of porcelain enamel that doesn't wear or mar, is so easy to keep spotlessly clean, and stays beautiful year after year after year. If you manufacture household appliances, or any product that will be the better for a porcelain enamel finish inside and outside, you owe it to the integrity of your trade-name to check the superior advantages of Pemco Porcelain Enamel that offers the economy of performance which only uniformity can assure. Production-proven Pemco materials have become the measure of progress in the porcelain enameling industry.

PEMCO CORPORATION *"Always Begin with a Good Finish"*

5601 EASTERN AVE., BALTIMORE 24, MARYLAND

Copyright 1952, Pemco Corporation

"THE WORLD'S FINEST" PORCELAIN ENAMEL FRITS • GLAZE FRITS • PORCELAIN ENAMEL COLORS • GLAZE STAINS • GLASS COLORS AND RELATED CERAMIC MATERIALS

ADS OUT

The big squeeze in aircraft fabrication

picturing a trend to one-piece components to replace the system of "bits and pieces"

by Howard Engler • SUPERINTENDENT OF FABRICATION, RYAN AERONAUTICAL CO., SAN DIEGO, CALIF.

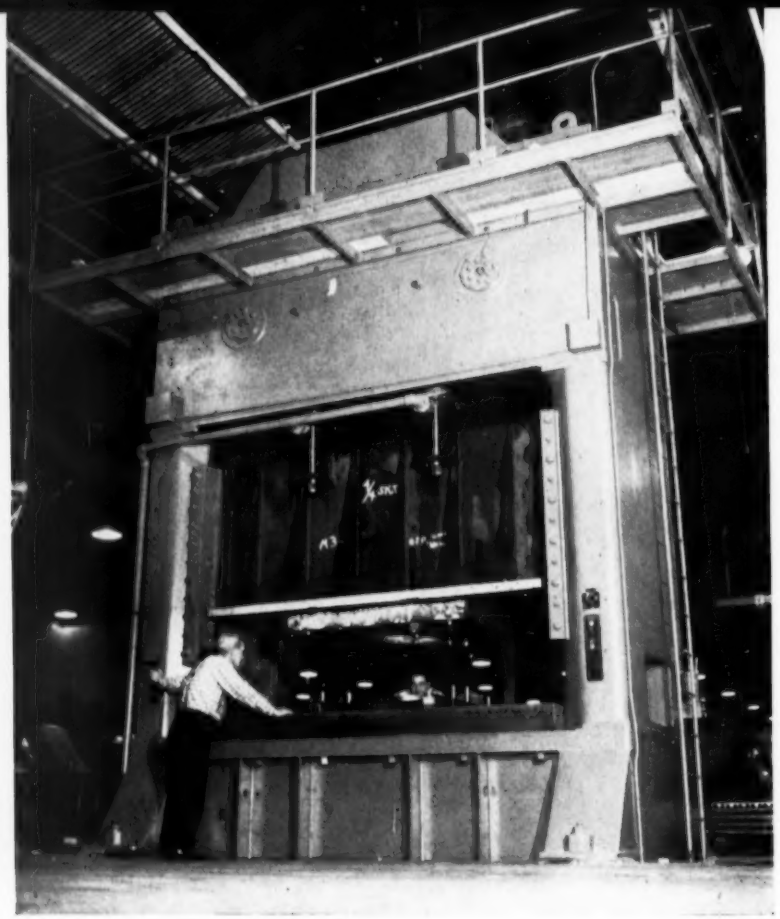
DEFENSE PRODUCTION FEATURE

Four huge new presses have been installed in the Ryan factory to step up production of high temperature structures for jet engines. Capable of exerting up to 600 tons pressure at a stroke, these mammoth machine tools can stamp out parts for exhaust cones, transition liners, aft frames and other jet components at amazing speed. Largest of the presses — a 230,000-pound giant — is the biggest piece of equipment ever installed at Ryan.

The arrival of the presses highlights a production trend which is influencing the aircraft industry. Greater emphasis is being placed upon the design and fabrication of large, single-piece components, which can be pressed out in huge machines, rather than forming these structures by joining innumerable small parts. The old era of "bits and pieces" is giving way to this newer philosophy which is limited by the availability of big presses and new designs. Ultimately, this trend could save millions of man-hours and many tons of machined metals by stamping out large aircraft components as fenders are pressed for automobiles.

Above: Typical of the important new structures which Ryan is building are these rows of exhaust cone assemblies being readied for shipment to General Electric. Designed for handling high temperature jet engine exhaust, these units are now being blanked and pierced in big presses instead of going through numerous hand operations formerly required.

An example of the benefit of this trend is illustrated in the use to which Ryan is putting the large presses in fabricating exhaust cones for General Electric J-47 jet engines. Formerly, the large stainless steel skins for these cone assemblies had to be cut in patterns by both power shears and rotary cutters. Then, they were manually drilled with radial-arm drills and placed in punch presses where special dies blanked the cut-outs for fittings. After these operations, the



Left: Huge 600-ton press is one of four new units used to blank and pierce jet engines. These presses are unusual in that they are eccentric geared, and utilize straight shafts.

holes were de-burred and the sheets were rolled and welded.

One hour of labor, and a number of machines, dies and individual handlings, were required to prepare each skin prior to rolling. Now, the same results are accomplished in a fraction of the time by using the large press. Precision steel dies, weighing six tons and costing thousands of dollars, are placed in the spacious 4′ x 9′ bed of the largest press. The stainless steel sheet is located on the die and — Presto! 600 tons of crushing force blanks and pierces the complete sheet with utmost precision. De-burring is kept to a minimum because the close-fitting dies shear cleanly with little burr residue.

Using four-stage dies

Ryan production planners are similarly capitalizing upon the flexible power of the new presses to streamline the production of J-47 combustion chambers, transition liners, aft frames and afterburner parts. The big machines will be used to form, draw and emboss these components as well as blank and pierce them. In some cases, four-stage dies can be used in a single press bed so that each stroke of the ram can perform four different press operations.

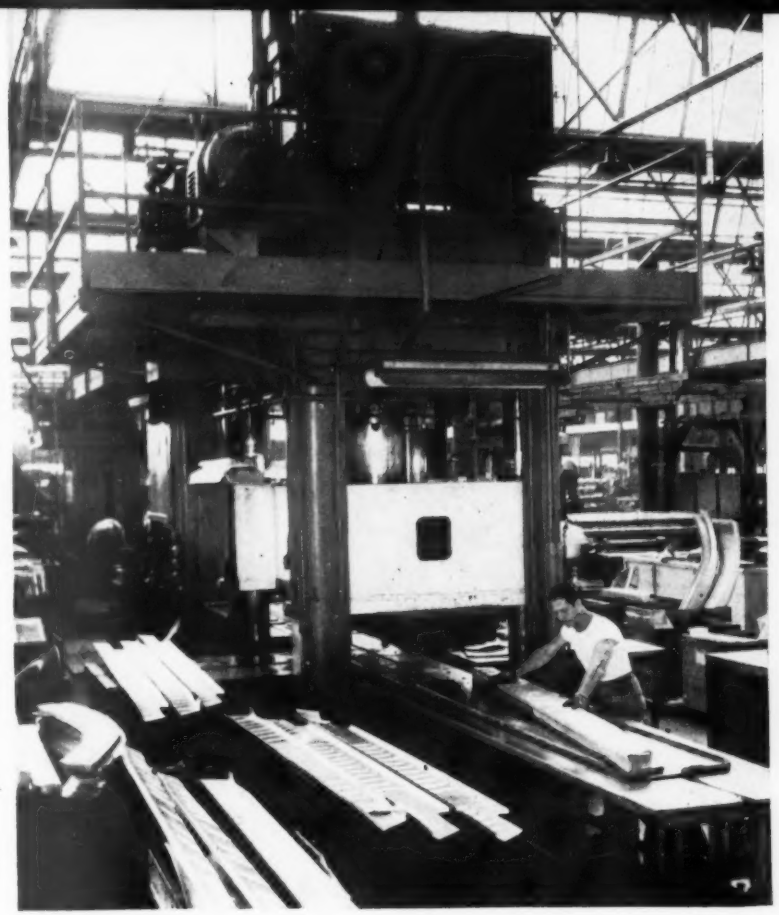
The new big presses incorporate the latest press design concepts. They are constructed from rolled steel, box-type weldments and are actuated by an unusual eccentric gear drive. In contrast to crank and eccentric shaft presses, these units transmit their tremendous power through straight shafts and twin-driven eccentric gears, thus eliminating torsional loads and "wind-up" on the main shaft. Their pressing action is smoothly and accurately controlled by pneumatic clutches and brakes which engage instantly.

The addition of the new units nicely rounds out the facilities of Ryan's "press room" which now contains 25 presses ranging in capacity from 30 to more than 1000 tons. These metal crushing giants can perform all four of the major classifications of press function: blanking, forming, drawing and squeezing.

Blanking in heavy presses

In blanking, the metal is sheared by stressing it to the point of fracture. Heavy pressures are required, and the force must be exerted at the

Right: Stretch-forming a large aluminum alloy skin which will go into the refueling pod for aerial tankers. Although mis-named, in view of the way it forms, the stretch press is a valuable tool which accomplishes a unique task.



Right: The Ryan press room includes a number of hydro presses used for all types of forming. This large 1000-ton unit is being used to form intricate webs for floor beams for the Boeing C-97.

point of impact and then quickly released. For blanking large parts, the eccentric gear presses and a 250-ton crank press are used. These machines have large beds and long ram strokes. Their maximum forces are exerted one-half inch before the ram reaches bottom center position and are suddenly released an instant later as the ram changes direction.

For blanking smaller components, Ryan schedules production through a bank of punch presses which have capacities ranging up to 105 tons.

Hydraulics used in forming operations

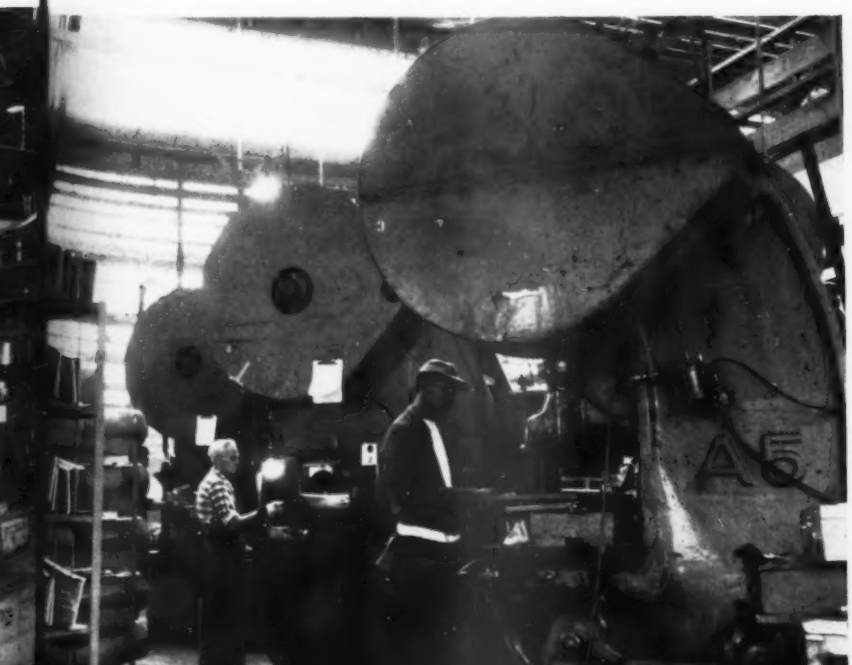
In forming, the metal is bent, with stresses in tension and compression on both sides of its neutral axis, but is not as severely stressed as in drawing. Many types of forming are accomplished on the new presses. Parts with intricate detail, such as the C-97 floor beam webs, are usually formed on 1000-ton hydro presses. These hydraulically-actuated presses have a smooth, accumulative action and rubber pads which are adapted to aluminum alloys. Unlike the eccentric gear and crank presses, their ram movement is determined by pre-setting the hydraulic pressures to be attained. As the ram descends against the die, the hydraulic pressure rises until it reaches the specified tonnage. At this point, the pressure is automatically released and the ram is raised. Obviously, the hydro presses are not designed for blanking operations.

For forming straight angles in sheet metal sections, Ryan utilizes four press brakes. Used also for multi-punching operations, these machines have a capacity of 30 tons.

One of the more severe types of press work is that of drawing, or causing the metal to flow from a flat sheet, or previously drawn shape, over a drawing die. As the metal is drawn over the die, its outer circumference is reduced and the metal crowded together. This crowding ceases as the metal goes over the die radius and into the shell side-wall.

The force of the punch produces a radial tensile stress which causes a resultant compressive stress in the flat portion of the sheet. If this compressive stress materially exceeds the tensile stress, wrinkling will result. To prevent this deformation the

to Page 54 →



Left: Thirteen punch presses comprise Ryan's facilities in this components fabricating section. These 105-ton presses are kept busy blanking and forming stainless steel components for jet engine combustion chambers and struts.

This Ain't No Time To Bunt!

The buyer is doing the pitching now—and throwing a mean sales curve, with a sharp drop in it. He is all tightened up; he shops carefully, compares closely, and then buys—*maybe*. Only products that outshine competition and are aggressively pushed by the dealer get his money today.

Many leading manufacturers whose names you know and respect, insure their sales by providing the superior finishes produced from Ing-Rich PORCELFRIT. They know from long experience that Porcelfrit finishes win quick acceptance from the customer, are so wear-resistant that they stay sold, and get enthusiastic selling support from the trade. Can you afford to go to bat with less?

If your products do not now have the sales leverage of this better porcelain finish, let us show you *why* PORCELFRIT has been specified by a long list of top-flight leaders year after year. Listening costs nothing but thirty minutes of your time.

6 GOOD REASONS FOR USING PORCELFRIT...

1. EXPERIENCE—Since 1901 Ing-Rich has pioneered in porcelain enameling. We have learned a lot in that time—and our customers profit by it.

2. PLANT TESTING—Right in our own porcelain enameling plant, under conditions of actual use, we use PORCELFRIT. When you get it, *it's right!*

3. FEWER REJECTS—Rejects cut your profits and PORCELFRIT cuts rejects to a minimum.

4. SERVICE ENGINEERING—Our service engineers are available to make sure that PORCELFRIT works right for your product . . . you take no chances.

5. LABORATORY CONTROL—Our ceramic engineers maintain constant contact with the production staff to make sure of highest quality.

6. IMPROVED SMELTING—Ing-Rich uses unquestionably the world's finest smelting method, the result of exhaustive research and experiment.

INGRAM-RICHARDSON, INC.

OFFICES, LABORATORY AND PLANT
FRANKFORT, INDIANA

ING-RICH
PORCELFRIT
"The Plant Tested Frit"

Cost reduction of stampings by cost analysis methods

effects of cost reduction in relation to business progress and survival, where to look for cost reduction, and qualifications for a cost reduction engineer

PART I

by James M. Leake • *PRESIDENT, THE LEAKE STAMPING COMPANY, MONROE, MICHIGAN; AND FINISH TECHNICAL CONSULTANT*

THE stability of any firm in the pressed metal industry depends on being able to offer maximum values while earning a fair return on its investment. Leadership depends on constantly striving to give more for the money. This may be approached from two directions. The product may be improved without a rise in price, or the cost may be lowered without sacrifice of quality.

The return of greater competition in our industry and our system of price controls provides additional incentives to search every possibility for new savings. Failure to carefully scrutinize every element of cost and bring them into proper focus with existing conditions fans the destructive flames of inflation. Increased efficiency is the most potent non-inflationary approach to the vicious built-in spiral system of our present day political set-up.

Pre-production estimates and post-production analyses

Survival in times of stress requires an intelligent realistic appraisal of costs. Pre-production costs must be determined by sound cost estimating. Post-production costs may be more realistically analyzed from actual cost records. A selling price that is too high can be as devastating as a price that is set too low. Few of us can afford to sell at a loss.

All of us must exercise extreme caution in processing our estimates and establishing sound selling prices. There can be a justifiable difference in honest quotations. Many firms may not have the ideal equipment for every operation. Some firms specialize in certain types of products, and in some lines may have a more efficient operational set-up. Some firms quote more cautiously on products outside the realm of their actual experience.

JAMES M. LEAKE

Legitimate price variations may puzzle stamping buyers

Some firms may lack the equipment to run products from coil stock in automatic presses. Often, lack of proper equipment prevents combining operations to the maximum advantage. These are but a few considerations that could result in price variations that must often puzzle stamping buyers. But every firm must be able to hit the right combination on enough occasions to get its share of profitable business.

It may be temporarily convenient to have an abundance of orders for non-competitive products where costs are not a factor now, but it is a poor conditioner for the coming events that we are likely to be called on to face. Such a condition is more likely to prepare one for oblivion.

No firm can afford to ignore the economic facts of life. New barriers are set up each day. Prevues of the future cast their shadows before them. Each new development starts a chain reaction in myriads of products. One must keep abreast of these changes or shrivel by the wayside. *Competition is on the way and all must prepare for it.*

REDUCING STAMPING COSTS BY REDUCING WASTE

I recently asked a British visitor what he had observed in America that impressed him most. After a brief pause, he replied, "It is the unusual size of your garbage cans." In a world that is encompassed by want, we as a nation should be ashamed of our wastefulness in many directions. Perhaps we shall not change our habits until forced to do so by our own shortages.

Oversize scrap piles mean waste

Perhaps it might just as truly be said of the job stamping industry that the dis-proportionate size of our

scrap piles indicates an equally shameful picture of waste. In this also are we unworthy of our abundance. At the present rate of consumption our resources cannot avoid ultimate dissipation.

Subduing waste and inefficiency must never be deferred until one comes face to face with emergency. Side stepping any problem only postpones its solution with compound interest. Following the course of the least resistance will only precipitate the inevitable crisis. Bad habits will not vanish of their own accord. So it may as well be faced — and now.

Does your plant waste equal your profits?

A close analysis of waste, spoilage and inefficiency might disclose a waste comparable to profits in many instances. Many firms give this some attention and think they are doing a thorough job. But the task is just too large to be as completely successful as it should be. This is a project that must be constantly pursued with relentless diligence.

Waste presents a vicious cycle. It is one of the most inflationary ingredients in our economic structure. It is an expensive luxury that benefits no one. It penalizes profits in business and raises taxes in Government. It operates twenty-four hours of each day and takes a tremendous toll in every phase of our existence.

In the elimination of waste, our first consideration must be an effort to search out where it exists. The logical start of such a search must be in the elements that comprise costs. Our cost reduction program should begin with men, material and machines.

By keeping abreast of the latest implements of economy in our industry, we may discover possibilities for maximum improvement through product redesign, without sacrificing product appeal or utility. Cost reduction efforts have played stellar roles in the remarkable achievements of our nation's most successful enterprises, and it still works today.

"I JUST HATE COLD LUNCHES"

REDUCING COSTS IN A BILLION DOLLAR INDUSTRY

The progress of the job stamping industry during the past 50 years is the result of offering maximum values at minimum costs. During this short span of years it has become a billion dollar industry. It now ranks favorably with other metal fabricating industries that are older by a hundred fold.

The luxuries of yesterday, with the advent of stampings, have become the necessities of today. People are demanding more and more of everything made from stampings. This pent-up demand must not only be satisfied, but also at a price level which a maximum number of people can afford to pay.

Adapt new processes and developments

We must ever be alert and adopt, where applicable, every new process or development that will contribute greater values at minimum costs. With the advance of living standards through maximum efficiency, we must constantly pioneer to keep in the vanguard of progress. This is essential not only for each individual stamping firm, but also from the standpoint of the entire industry.

In some industries, the combination of abnormal profits and excessive costs may survive over a long period of time. Of course that has never been true in the job stamping industry. In any industry, this condition will inevitably lead to a host of competitors. Investment money awaits an opportunity to enter an obviously profitable market. The entrance of this competition is bound to lead to embarrassing problems.

Firms that operate loosely in extremely favorable times invariably find it impossible to tighten their belts when the going becomes rough.

to Page 55 →

Synthetic resins for industrial finishes

a comprehensive three-part review of industrial finishes, basic materials, their characteristics and present stage of practical application development

PART I

by William von Fischer • HEAD, DEPARTMENT OF CHEMISTRY AND CHEMICAL ENGINEERING, CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO

NEW developments of recent years in coatings have emphasized greatly the replacement of what is now referred to as "old-fashioned" oils and varnishes with synthetic resins. In fact, this trend has become so pronounced that it becomes difficult at times to distinguish the line of demarcation between modern paint technology and the technology of plastics. Indeed, it would seem as if a completely new era of coatings design has come about which should revolutionize the whole art of the industrial finishing shop. Literature which exalts the progress through synthetic resin finishes is not something recent.

Any practical paint shop man, who has been reading his trade journals, can recall that such promises of revolutions in coatings have been reported continuously now for a number of years — so much so that by this time it sounds like an old record repeating itself on new titles. No doubt, the practical man is often tempted to ask, where is the practical realization of these processing developments reported in the trade literature? If these new things are so wonderful, why haven't they revolutionized finishing shop practice before this? Is the attitude of metal finishes overly conservative, or are there sound engineering reasons to explain why laboratory "wonder finishes" cannot meet the competition?

There is no simple answer to any of these questions. While there may be some reactionary response to change, it is a matter of history that the progressive attitude of industrial finishing shops has advanced the art of production finishes far ahead of many other coatings materials.

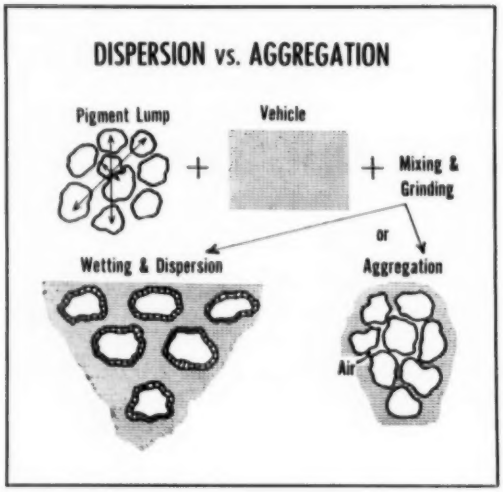
If one examines the record over many years, revolutions have occurred in new finishes. However, the changes over rather short term intervals are so gradual that the record of immediate accomplishments often seems meager. At any rate, one is prone to feel some discontent with the rate with which new developments are fitted into the industrial picture as a mass-production operation. If the explanation of being over-conservative is not adequate to explain the slow transition rate of introducing laboratory novelties to production, then we have to blame it on the technical problems of the transition.

No one who works with materials or methods can fail to realize that perfection of a material and process in all details is an ideal and practically never a reality. A practical engineer in coatings application, for example, deals with a multitude of variables. In his own mind, and in his verbal requests, he publicizes only those problems which make a current process or current material deficient.

In being of assistance, the resin chemist or coatings formulator responds to this emphasis on special problems. Frequently a new material is developed that solves a problem that has greatest publicity; for example, better alkali resistance, or better resistance to salt brine, etc. The new material may also lack the major deficiencies of the old. Ordinarily, however, it introduces new problems of its own. Many things that were taken for granted with the old material now become new problems of the new material. Before the new materials can be used in production, all new engineering difficulties have to be brought under control, and this frequently becomes such a formidable problem that the finishing shop prefers to live with the old problems rather than incur the new difficulties which are the inevitable consequence of solving old deficiencies.

Chronological Listing of Earliest Experimental Use of Synthetic Resins (Plastics) in Coatings

1910-19	Phenolic Resins
1920-25	Alkyd Resins (Oil-Modified)
	Cellulose Nitrate and Acetate
1925-31	Vinyl Polmers (Chloride-Acetate)
	Acrylate Resins
	Cellulose Aceto-Butyrate
	Urea Resins
1932-37	Ethyl Cellulose
	Polystyrene
	Synthetic Rubber
	Vinyl Acetals
1938-43	Vinyl Resins (Acrylonitrile-Vinylidine Chloride)
	Nylon and Polyurethane Resins
	Melamine Resins
	Allyl and Unsaturated Polyester Resins
	Cyclohexanone Resins
1943-51	Epoxy Resins
	Polyethylene
	Poly Fluoro (or Fluoro-Chloro) Ethylene
	Silicones



The dispersion of pigments in synthetic resins is a difficult problem. A true dispersion, as shown in lower left, is easy to obtain if the paint vehicle is a drying oil or contains substantial quantities of oils. In the instance of synthetic resins, it is difficult to avoid formation of pigment aggregation which results in inferior decorative properties and poor film strength.

Any review of synthetic resin developments which fails to consider the place of new materials in the overall production picture would be of very limited value. By this I do not imply that new materials should not be considered because when they help in one thing they present failures elsewhere. It is important, however, to weigh continuously possible advantages versus necessary disadvantages for each possible improvement. Where this is done, it becomes much easier to judge whether undertaking a new venture is worthwhile. Undoubtedly, the new material will give some notable advantages. The disadvantages hamper a new development usually because they are unanticipated, and not provided for in the new design, because excessive attention has been given to only the optimistic anticipations of the new materials' benefits.

In this review, we will attempt, in as far as is possible, to evaluate the whole story regarding new resin developments and their practical implications to industrial finishing. The coverage will emphasize more the positive values. In this sense, it will seem in part to carry the theme of the more optimistic trade literature. However, we will try to indicate enough of the reverse side of the coin in each instance so as to get a better understanding of the overall status of the more important developments.

Synthetic Resins for Industrial Finishes

Class I — Systems Containing Alkyd Resins

A. Alkyd Resins, oil-modified
   1. oxidizing (air-drying types)
   2. non-oxidizing types

B. Resin Mixtures containing alkyds
   1. Two-component mixtures
      a. alkyds plus phenoplasts
      b. alkyds plus aminoplasts
      c. alkyds plus nitrocellulose
      d. alkyds plus chlorinated rubber
   2. Three-component mixtures
      a. alkyds plus epichlorohydrin resin plus aminoplasts
      b. alkyds plus vinyl resins plus aminoplasts

C. Alkyds modified by chemical reaction with other resins
   1. styrenated alkyds
   2. silicone alkyds

Class II — Systems Containing No Drying Oil or Alkyd

A. Curing (or thermosetting) types
   1. phenoplasts
   2. epichlorohydrin resins
   3. allyl and other polyester resins
   4. silicone resins
   5. aminoplasts

B. Non-curing (or thermoplastic) types
   1. resins derived from cellulose
   2. synthetic and natural rubber types
   3. vinyl resin types
   4. acrylic resins
   5. nylon

Classification of synthetic resin finishes

A classification of synthetic resins can be very complicated if one should attempt it by the most difficult route of establishing them into groups according to chemical properties. This has been done frequently for resins in general, and virtually every type chemical resin composition is represented somewhere in some type of coatings formulation. The text books list two major classifications in terms of reactivity at elevated temperatures, namely:

1. *Thermoplastic resins* which soften (or melt) when heated, and harden again when cooled. These are the types of resins used in many lacquers, e.g. nitrocellulose, vinyl, parlon lacquers, etc.

2. *Thermosetting resins*, which harden and become more infusible when heated to elevated temperatures. This class contains, for example, phenolic resins (Bakelite resins or phenoplasts) and urea resins.

Since these definitions pre-suppose an elevated temperature, the definitions are inexact because we cannot define arbitrarily what we mean by *elevated temperature*. A better distinction between thermoplastic and thermosetting resins would be that thermosetting resins can undergo a curing reaction at some temperature which renders them more resistant to solvents, and greatly increases the melting point, film strength, and usually the hardness. Some thermosetting resins can be brought to that state at room temperature; some may require many hours of baking at temperatures up to 450° F.

Thermoplastic resins exhibit comparatively little chemical change even at high temperatures. It is not always true, however, that thermosetting or curing resins are baked and thermoplastic resins form films only by solvent evaporation at room temperature. Some thermoplastic film-forming resins need be baked at temperatures exceeding 500° F. in order to get them to form a good film. We say these resins have to be sintered or fused. For these special thermoplastics, the fusion tempera-

ture is often greater than that required to cure nearly all useful types of thermosetting resins.

Also, chemically speaking, nearly all thermosetting resins, when cured, still contain appreciable quantities of thermoplastic material (and hence do not have absolute solvent resistance), and most thermoplastic resins tend to cure slightly during film forming or aging (and hence become somewhat less soluble than they were in their original condition).

To complicate the picture further, practical coatings are formulated nearly always from a mixture of resins of both thermoplastic and thermosetting types, and while we speak of vinyl finishes, or melamine finishes, or alkyd finishes, we understand the name as identifying only the one constituent of a resin mixture which we regard as dominantly important, or which we most want to publicize. There is no such thing as a pure resin. Resins, by their very nature, are heterogeneous materials even where we manufacture them from the simplest pure ingredients.

All of these remarks regarding complexity of classification only serve to emphasize the following points:

A. Apart from rigorous scientific classifications that have meaning only to organic chemists, there is no simple way of classifying resins, particularly as they are used in coatings.

B. Since it is impossible to define even a good classification, popular attempts at generalizations such as the fact that thermosetting resins are more solvent-resistant than thermoplastic, or that thermoplastic resins are more flexible, must be very inexact and any thinking in such terms will likely be wrong more frequently than it is right. Almost any particular film properties, such as alkali resistance, gasoline resistance, flexibility, etc., can be obtained with either type of resin, or most frequently by using mixtures of different types.

C. Since nearly all seemingly more scientific classifications are inexact, a more useful classification could be such that will have meaning for a specific problem—for example—the problem of applying the best corrosion protecting coating possible in a production operation. To set up what one might call a finishing shop classification, it would be necessary to emphasize the features of application properties, and appearance as well as protection.

Regarding appearance, materials seem to fall naturally into three categories, namely:

1. Protective finishes having maximum decorative properties
2. Protective finishes having limited decorative properties
3. Protective finishes where protection is all important and decorative properties can be neglected.

By maximum in decorative properties, we imply a wide range of control over properties such as smoothness, gloss and color. It is an unfortunate dilemma of present day coatings formulation that if we overemphasize protection, we often tend to lose control of appearance, and vice versa. If we emphasize protection, for example, we have to use pigments which are protective but not decorative, or to use resins which lack gloss or cannot be pigmented with color, or all these difficulties may occur simultaneously.

In general, some sort of compromise can be effected by using multicoat paint systems, where, for example, we rely for protection on undercoats and for appearance on topcoats. This approach is only a limited one even though frequently a necessary compromise. Ordinarily, complete paint systems cannot be constructed from materials which are very dissimilar, e.g. alkyd finishes over a vinyl type of marine primer, or polyethylene over varnish-base primers. If we mix very dissimilar materials in a multi-coat paint system, ordinarily some or none of the materials can be used to their ultimate limits with respect to either decorative or protective properties.

In practical industrial finishing, the success or failure of a new paint depends on the extent to which it can become involved in a paint system which meets satisfactory standards in both appearance and protection. This feature is frequently overlooked in proposals that suggest new resins for new finishes. Only relatively few coatings problems are such where decorative properties and easy application can be sacrificed in order to get maximum protection.

Even where an ideal complete paint system may exist in theory, it can be non-existent in practice in particular paint shops. For example, often the best system cannot be used if it requires baking, as in the finishing of a completely assembled passenger bus or army tank. Sometimes even though a baking operation is possible in a particular shop, this equipment may not be adaptable for baking at excessively high temperatures. Possibly the economics of paint application require dipping, brushing, or roller coating. If a desirable paint system, or some component of it, can be applied only by spraying, by hot melt techniques, or by some procedure that is not economic for the geometry of the article to be coated, then, no matter how good the paint, it cannot be used.

All of these complications need bear on the question of selecting a synthetic resin paint system.

William von Fischer — *is a professor of chemistry and head of the Department of Chemistry and Chemical Engineering at Case Institute of Technology.*

He was born in St. Paul, Minnesota, and attended the University of Minnesota where he received his bachelor's degree in chemistry in 1932, his master's in 1935, and Ph.D. in 1937.

In 1937 he was appointed to an instructorship in chemistry and chemical engineering at Case, and attained the rank of full professor ten years later. In September, 1948, he was made head of the department.

In 1940, von Fischer established a paint and varnish educational program at Case. Both class and laboratory courses in the field have been offered since that time. He is the editor of "Paint and Varnish Technology" (Reinhold, 1948), the first one-volume treatment of chemistry, formulation, manufacture, and application of paints and varnishes, and has written numerous technical articles on the subject. A second book, on organic protective coatings, is now being readied for publication.

Project	Security Building
Location	Denver, Colorado
Owner	Bosworth Building Corp.
Architect	Roland L. Linder & Associates
Structural engineers	Phillips-Carter & Osborn, Inc.
General contractor	Peter Scerie, Inc.
Porcelain enamel contractor	Porcelain Enamel, Inc.

Modernizing a 25-year-old building

an example of exterior treatment which may start a trend in building modernization

by Howard Michel • PORCELAIN ENAMEL, INC., TULSA, OKLAHOMA

THE Security Building, a 12-story reinforced concrete structure containing approximately 75,000 sq. ft. floor space, facing 125 ft. on 17th Street and 50 ft. on California Street, Denver, Colorado, was built in 1926. Typical of style at the time, the building was heavily ornamented with massive projections, statuary, gargoyles, etc., and with heavy turret-like parapets.

While beautiful 25 years ago, the building needed a face lifting to bring about more modern appearance. The owners, realizing that such a face lifting, if it could be kept in reasonable cost limits, and could be made self-amortizing, would appreciably increase their overall property value.

Roland L. Linder & Associates, architects, in their preliminary investigation of this difficult transformation conducted broad studies of all available exterior facing materials. As a result of these studies, architectural porcelain enamel was selected because of its permanence, lightness in weight, low initial cost, freedom from expensive maintenance, and its wide range of colors, textures and shapes which allows almost complete freedom of architectural expression.

Building weight reduced 900 tons

The building was stripped back to original structural members through

the removal of approximately 900 tons of brick and terra cotta. The turret-like parapets alone contained 80 tons of material. It is interesting to note that the total weight of the new porcelain enamel material was only 30 tons.

To retain desirable vertical line effect, light-weight 7-inch steel channels were fabricated and jig welded into lattice-like framework sections in the shop of Peter Seerie, Inc. These sections were then transported to the job site and welded to existing shelf angles at each floor line, forming the pilaster sub-structure.

The job was now ready to receive architectural porcelain enamel panels. "J" hangers were electrically stud-welded to pilaster sub-structure to receive the panels which had been made from 16 gauge steel sheets having one inch flanges on all four sides, and provided with welded stainless steel hanging clips of a recently patented design which locks each panel securely in place. The panels were generally 4 sq. ft. in face area.

Acid resisting finish used

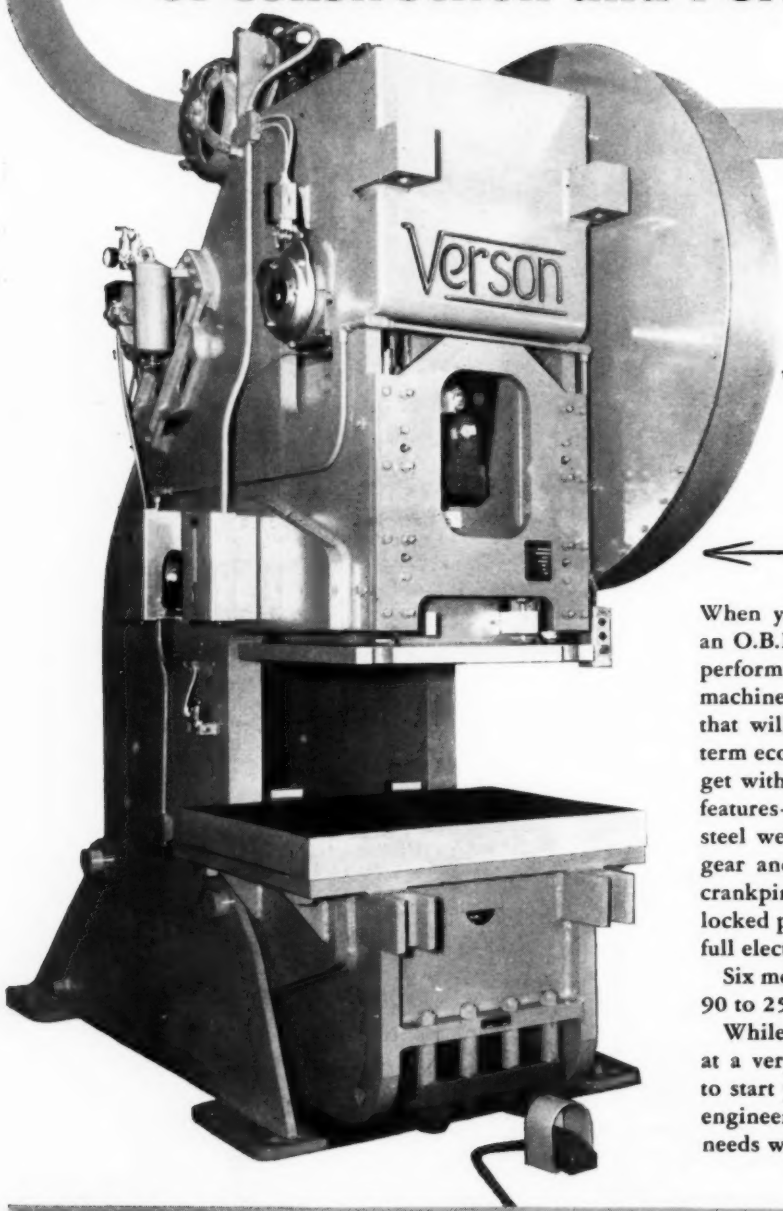
Return flanges into windows and at corners varied from 8″ to 16″ in depth. Holes of appropriate diameter were provided in the panels at window returns to facilitate installation of necessary window cleaning hooks. Panels were developed from acid-resisting porcelain enamel in a shade of pastel green, stipple finish, which was pleasantly contrasted by aluminum-colored caulking compound. The 3/16″ joints were provided to receive compound and to allow for expansion and contraction. As panels were set in place, all one-inch flanges were buttered with alumalastic caulking compound. After setting a limited area of panels, a specially prepared okum in rope form was inserted into buttered joints half way back from face of panels. Following this the entire job was pressure-caulked by gun with alumalastic compound and then struck to obtain a slightly concave surface. After caulking, all surfaces were cleaned of dirt and oil film.

This completely successful modernization of a multi-story exterior may well be the forerunner of similar projects.

Welded stainless steel hanging clips, of a new design, are used to lock the architectural porcelain enamel panels securely in place.

This photo, taken in an early stage of the project, contrasts with the photo on the opposite page taken after the "face lifting" was completed.

You get BIG Press Standards of Construction and Performance



in

TRADE **Verson** MARK

O.B.I.'s

When you can combine the versatility of an O.B.I. press with the construction and performance standards of big, expensive machines, you get a real production tool that will give you the best possible long term economy . . . And that's just what you get with Verson O.B.I.'s. Just check these features—gears running in oil . . . heavy all-steel welded frame . . . machine cut steel gear and pinion . . . split cap main and crankpin bearings . . . mechanically interlocked pneumatic clutch and brake unit . . . full electric controls . . . many others.

Six models, with capacities ranging from 90 to 250 tons are available.

While the demand for Verson Presses is at a very high level, now is a good time to start your long range planning. Verson engineers will be pleased to go over your needs with you.

Originators and Pioneers of Allsteel Stamping Press Construction

VERSON ALLSTEEL PRESS COMPANY

9320 South Kenwood Avenue, Chicago 19, Illinois — So. Lamar at Ledbetter Dr., Dallas 15, Texas

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
DIE CUSHIONS • COMPRESSION AND TRANSFER MOLDING PRESSES

Pressed Metal Institute holds third technical meeting

discuss tooling for short runs, scrap, factors in making stamping quotations, technical knowledge for salesmen, and quality control

(illustrated with finishfotos)

MEMBERS of the metal stamping industry met in Cleveland, Ohio, on March 20 and 21, for the third annual spring technical meeting sponsored by the Pressed Metal Institute. All sessions were held at Hotel Carter, site of the previous PMI technical meetings.

Gaining in stature as a "must" meeting for men interested in promoting stampings, this year's sessions were attended by nearly 200 stampers representing 104 companies. Men from both "job" and "captive" stamping plants were in attendance.

Chairman of this year's meeting was Fred R. Burns, of Central Steel & Wire Co., Chicago, and chairman of the PMI associate members.

TOOLING FOR SHORT RUNS

Moderator for Thursday's opening panel session, on "Tooling for Short Runs," was C. C. Caditz, president, Northern Metal Products Co., and chairman of the PMI Chicago District.

Panel members included: K. P. Martin, of The Cincinnati Milling Machine Co., Cincinnati; T. K. Reid, of H. P. L. Mfg. Co., Cleveland; Peter Kilham, of Kilham Engineering, Inc., Plainville, Mass.; Byron Nierenberg, of Hydropress, Inc., New York City; Henry R. King, of Masonite Corp., Chicago; John Cummings, of Wayne Foundry & Stamping Co., Detroit; and J. C. Rumbarger, of S. B. Whistler & Sons, Inc., Buffalo.

W. T. Hoyt discussed scrap.

Marform process

Nierenberg opened with a report on the Marform process. "This process aims at the elimination possibly of most of the tooling, particularly the expensive part of tooling for short runs. It eliminates it by not needing a female, in accomplishing deep drawing or heavily contoured parts. The female is a heavily pressurized rubber pad which is universally adaptable to a male punch, which has the shape of the part to be made.

"We feel that it not only eliminates the manufacture of the female, the matching of the two ways, which is usually time-consuming and costly; but it eliminates things like difficult try-out presses, for example."

The usual parts that are slated for steel dies, drop hammer, which would include contour parts, complicated contour parts, would be natural for Marform, stated Nierenberg. Regarding tolerances, he added, "We can think in terms of as close of .002."

Hydroform process

Regarding the Hydroform process, Martin stated, "We use, instead of solid rubber, a laminated rubber con-

tainer, hydraulic oil, with rubber diaphragm application. . . .In our case, we make the male punch, and a lower draw ring.

"The range of our work," said Martin, "is approximately that we have worked out about .002 aluminum foil, and in some special work up to as high as ½ inch steel. I believe we could go higher. . . . The principal advantage is saving in tools."

Adjustable dies

Speaking of adjustable dies, Rumbarger said that "generally speaking, they do not completely fit into the short run fields as we ordinarily think of short runs. Primarily we deal with square sheared blanks, punched, notched to some extent, formed, so to speak, louvers, lances, etc. . . . . We operate in the sheet metal field, rather than the plate field . . . . The tendency has been that what was orginally termed short-run dies, have become actual production tools."

Forming machine for short-runs

Kilham's report was centered about a Bendit metal forming machine.

Metal sheets, rods, strips and tubing can be bent and shaped into many complex as well as simple forms. Its operation is as fast as the operator can manipulate the machine, up to 20 bends per minute in light stock. The machine's capacity ranges from 18 gauge steel, 15" wide, to ⅜" round bar stock, said Kilham.

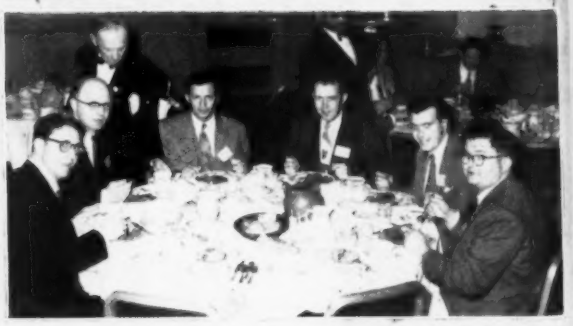
THE SCRAP SITUATION

W. T. Hoyt, executive secretary, Steel Industry Scrap Mobilization Committee, New York City, was guest speaker at the Thursday luncheon. He was introduced by William J. Primrose, Jr., of The Dickey-Grabler Co., Cleveland, and chairman of the Northeastern Ohio District of PMI.

The people of this country must not let up in their search for domes-

Top: G. F. Sindelar, D. Pressler, Variety Machine; D. D. Hawkins, F. W. Potts, J. F. Wallace, Bingham Stmpg.; J. C. Rumbarger, Whistler. Center: R. E. Kreger, Detroit Stmpg.; R. H. Worthington, R. B. Duncan, Steel Service; T. Clark, Clearing; W. T. Browne, C. F. Patterson, Steel Service. Bottom: E. R. Sullivan, R. E. Olsen, Firestone Steel; J. J. Mirrione, A. F. Carthay, Channel Master; E. C. Weihe, C. F. Jensen, Illinois Tool.

Top: Steve Lazarski, W. J. Webster, Searles Mfg.; M. J. Lang, National Lead; S. G. Atwood, Chas. Getts, Carl Anderson, Atwood Vacuum. Center: L. A. Bourdon, Fred Miller, Frank Sutz, Rex Neely, C. J. Kachel, Hart Pressed Steel. Bottom: T. K. Reid, HPL Mfg.; E. J. Skramstad, Federal Tool; M. E. Lorentz, HPL Mfg.; A. M. Torgerson, WLS Stmpg.; W. L. Connell, Federal Tool; P. A. Smith, Suburban Metalcraft.



on quality control — *Lt. Col. VanVeen, W. Weaver, H. Jacobson.*

Tooling for short runs — *Fred Burns (chairman), Henry King, John Cummings, Byron Nierenberg, J. C. Rumbarger, C. C. Caditz, Peter Kilham, K. P. Martin, and T. K. Reid.*

ping quotations — *Glenn N. Hackett, Joseph J. Boehm, Phil C. Wood, and James M. Leake.*

Knowledge for salesmen — *E. C. Koellner, Wilfred Williams, Fred Burns, Owen Wenning, W. F. Ardussi.*

tic dormant scrap, said Hoyt. "We must push even harder because this domestic dormant scrap is our only salvation. We cannot look outside of America for help.

A ton of scrap saves four tons of natural resources!

"For years the plenty of our wonderful country was taken for granted. . . . Now we know that if we are to preserve our free enterprise system we must begin to conserve our assets. . . . Untouched sources of such raw materials as iron ore, coal, and limestone are conserved by the process of recycling scrap back into the production of new steel. The use of *one ton of scrap*, in place of one ton of pig iron, *saves more than four tons of natural resources*," stated Hoyt.

Deprived of scrap, the iron and steel industries would require more men, more machinery, more freight cars, as well as more raw materials, said Hoyt. He then emphasized the necessity for a continuing aggressive scrap campaign by pointing out that the average usage of purchased scrap during 1951 and 1952 will exceed by 44% the highest rate of consumption of World War II, which was during 1943. Yet consumers' inventories today are 40% lower than in 1943.

In conclusion, Hoyt pointed out that the inroads we have made into the reservoir of obsolescence scrap means that only by continuous effort can we obtain a total sufficient to meet our current regular demands necessary to support a war, defense and civilian economy.

STAMPING QUOTATIONS

Thursday afternoon's session was devoted to a panel discussion of "Estimating Factors and Cost Analysis for Intelligent Stamping Quotations." Moderator was J. J. Boehm, president, The Boehm Pressed Steel Co., Cleveland.

Panel members included: James M. Leake, president, The Leake Stamping Co., Monroe, Michigan (see Page 25); P. C. Wood, assistant to vice president of manufacturing, The Acklin Stamping Co., Toledo; and Glenn N. Hackett, director of purchases, Thompson Products, Inc., Cleveland.

Not enough questions for logical quotations!

"The consensus of those who buy stampings for our plants," said Hackett, "is that stamper's sales representatives don't ask enough questions about things that are vital to the preparation of quotations." He emphasized that this particular criticism applies both to companies new in the stamping business and to those with long experience in the field.

Features of stampings which salesmen often fail to explore are in the areas of basic design, tolerance requirements and material specifications as related to the ultimate end

Arvid Anderson, L. A. Shelton, New Monarch Machine; R. P. Miller, Luitink Mfg.; E. E. Pursch, Bob George; RBM Div., Essex Wire; Dave Dail, Don Wheelock; Dail Steel.

R. E. Boyle, F. J. Vejlupek, Konigslow Mfg.; G. A. Helberg, Tom Logan, Maytag; O. C. Carner, Parish Pressed Steel; John Kluever, Oliver Corp.

J. J. Sibisan, Fawick Airflex; R. Cowen, M. Phillips, Century Engr. (Canada); R.F. Wynn, Waterbury Pressed Steel; Harry Danits, Ashland Mach.; E.C. Koellner, E. L. Voigt, GP&F; G. McIntosh, Century Engr.

use of the part being purchased.

"Don't overlook the chance that you have to help your customers develop more intelligent quotation requests," concluded Hackett.

Essential qualifications for a stamping estimator

Discussing the personal qualifications of a stamping estimator, Wood listed three: a *broad education*, *experience* (especially in his own shop), and *sound judgment*. In addition, said Wood, a stamping estimator should be able to visualize new techniques and approaches and should keep abreast of new machine and material developments.

"What's so clever about it? The pitch diameter is .002 off."

COURTESY STANDARD PRESSED STEEL

To accomplish his task, the estimator must be supplied with accurate and detailed cost information. He can be assisted in his selection of operations if he is furnished with a complete set of records showing all parts produced in the history of his company, including information on the shape of the part, the operations used to produce the part, the presses required, blank size, etc. By studying these records, the estimator should be able to compare new parts with old, and thus benefit from the previous experience of his company, stated Wood.

STAMPING SALESMEN

The Friday morning panel discussed "Technical Knowledge for the Stamping Salesmen." Moderator was Wilfred Williams, sales manager, The Acklin Stamping Co., Toledo.

Panel members included: E. C. Koellner, sales manager, contract manufacturing division, Geuder, Paeschke & Frey Co., Milwaukee; Wallace F. Ardussi, president, Variety Machine and Stamping Co., Cleveland; and Owen H. Wenning, sales manager, Worcester Pressed Steel Co., Worcester, Mass.

Koellner approached the subject of "Technical Knowledge for Stamping Salesmen" from the sales angle.

How technical need a stamping salesman be?

"It is my firm belief," said Koellner, "that a presentable salesman who meets people easily, and instills confidence in himself and his company, is more of a sales asset than an engineer would be. Naturally, he should have a thorough knowledge of the capabilities and limitations of his organization. He should also be able to ready an ordinary blueprint so that he can recognize and bring in desirable inquiries and orders.

"There are many other requisites for a good stamping salesman that should take precedence over actual engineering knowledge. He should have the absorbent qualities of a "sponge" in picking up complete details and information so that an intelligent estimate can be prepared. He should be able to quote clearly and completely so there will be no later misunderstanding as a result of misrepresentation. If authorized to commit his company, he should be schooled in drawing up contracts and in the policies of his organization. He should be informed as to availability of materials and production capacity. He should be familiar with shipping facilities, and a multitude of other details, so that he can present a sales story convincing enough to insure getting the order—if he is at all competitive."

In conclusion, Koellner emphasized, "'Above all, remember that in the eyes of customers and prospects, the salesman is the personification of his company. . . . If he doesn't have all the answers, he can get them from the specialist back home who, in the meantime, is utilizing his engineering skill and knowledge in keeping the company's organization running smoothly."

Gaining experience in the plant

In his discussion, Wenning stressed the necessity of "a thorough knowledge of one's product."

"We must provide (the young salesman) the opportunity for contact with

to Page 56 →

Edison Electric Institute sales conference

annual sales conclave held at Edgewater Beach Hotel, Chicago, March 31-April 3

SPEAKING before the Residential Section of the Edison Electric Institute, during the EEI 18th annual sales conference, T. J. Newcomb, chairman of the NEMA Major Appliance Division, called for coordination of advertising and promotional efforts between appliance manufacturers and utility companies.

Individual manufacturers should be, and in many cases are, doing the job at both the consumer and industry levels, Newcomb stated. "'Electric light and power companies are doing the job locally in their own territories at the consumer level. The thought to bear in mind is that to get the most out of all these efforts, they must be coordinated. To gain full advantage of them, they must be followed up at the point of sale."

He then outlined the 1952 advertising and promotional plans of the Major Appliance Sections of the National Electrical Manufacturers Association. These include the range section, water heating section, and farm and home freezer section.

Summarizing the major appliance programs, Newcomb pointed out that the end result of all the campaigns will be the education of the public on the services and benefits contributed by electric appliances. The job is being done through those people who directly or indirectly influence the purchase of these appliances. "Such education is and will continue to be the necessary duty of the electric appliance and electric light and power industries," concluded Newcomb, who is also sales manager of the electric appliance division of Westinghouse Electric Corp.

The outlook for appliances

Speaking before an EEI general session, Jacob Baker, of the Economic Institute, stated that the "improvement of metal supplies means that *demand* will be the key to production of major appliances," adding that the demand for new appliances will be keyed to the various factors affecting "optimum ownership level"

GEORGE GADSBY, EEI PRESIDENT

and the replacement of appliances during the next few years.

"Supernumerary income (personal income less taxes and subsistence costs) is the income measure used in the calculation of the optimum ownership level. This year," stated Baker, "supernumerary income is expected to exhibit only minor changes, in line with the relative stability of the other general measures of the economy. In 1953, a continuation of the downturn in industrial activity will be reflected in moderate declines in supernumerary income, with the trend becoming steeper as the year progresses. . . .

"In 1952, the optimum ownership levels will increase only mildly as the number of families continues to grow, although at a reduced rate, and income moves upward relative to prices. Next year the optimum ownership level will remain stable and then register some mild declines as the effects of the shrinking income are not quite offset by the increase in the number of families.

"The replacement market in the next two years will not be as strong as it has been in the postwar period thus far. . . . Of course, *replacement sales can be stimulated by a strenuous campaign to turn in the not-so-new models for the brand-new models,*" stated Baker.

"A glance at the outlook for particular appliances in the next two years reveals that refrigerator production is likely to amount to some 3.1 million units in 1952, and 2.9 million units next year. Sales of electric washing machines are expected to reach 3.1 million in 1952, and 2.8 million in 1953.

An active market for dryers

Baker predicted that several relatively new appliances, including clothes dryers and garbage disposal units, will enjoy quite active markets.

A return to investor ownership

The EEI sales conference was brought to a close with an address by George M. Gadsby, Institute president, and president and general manager of the Utah Power & Light Co. The title of his address was "Socialism as a Competitor."

Although Congress is wisely refusing to permit "new starts" in socialism, said Gadsby, "our big job is to make a more effective factual presentation to the people of our own areas. Power industry organizations offer the means for the dissemination of information, and merit support by every investor-owned company. . . .

"Our industry has a magnificent record of accomplishment. . . . No other group in the entire economy has a larger expansion program. Of approximately $40 billion spent in 1951 and to be spent in 1952, the combined electric and gas industries account for $7.6 billion, which is 19% of the total. No feasible program for plant expansion to meet continuing industrial needs for electricity is too great for our industry.

"Once the people realize the implications of a national socialist power system, they will demand a return to investor ownership under local control working in cooperation rather than in competition with federal, state and local projects which can economically generate electric power, to the end that such projects may be built with the least possible burden on the taxpayer, and the benefits arising therefrom be distributed without preference or discrimination," concluded Gadsby.

1951 Dollar Volume of Electrical Appliances

Television	$1,570,800,000
Refrigerators	1,120,635,000
Washers (std. elec.)	722,425,000
Electrical Housewares	612,355,950
Freezers	378,000,000
Ranges	343,000,000

NOTE: Figures presented in an EEI Home Service Conference address by Mrs. Vivian Overand, northwestern director, Westinghouse Electric Corporation, Chicago.

There's no business like "know" business

a switch from consumer "buying" to retail "selling" is necessary

AN ADDRESS BEFORE EEI by R. J. Miller • THE CLEVELAND ELECTRIC ILLUMINATING CO.

MUCH has been said, and much has been written about the low ebb of retail selling — especially the low ebb of retail durable goods selling. Too many salesmen don't know their business in a business where they've got to know.

With employment at an all-time high — with family incomes at an all-time high — with discretionary buying power at an all-time high — and with savings at an all-time high — appliance sales are lagging 30% to 50% behind the first quarter of 1951.

While the causes may be numerous, one thing is apparent — appliance salesmen are no longer selling!

In too many instances, the appliance salesman merely puts his hands in his pockets, points at the product with his feet, says "Ain't it a beauty?", steps back three paces, and waits for the order.

In 1950, scare appliance buying (not selling) broke all records, and, nationally, the average residential use per customer increased 146 kwhr. Volume appliance buying (not selling) continued through most of 1951. The cumulative effect of these two years brought about an average residential increase of 174 kwhr for 1951. We're still riding on this cumulative effect with good kwhr increases each month.

But what is the outlook for the month ahead with appliance sales off 30% to 50%? This is something we must act upon if we are going to maintain some semblance of our growth rate.

From Philadelphia to San Francisco, from coast to coast, the need seems to be the same. And with a common need, it's safe to assume that we can offer a common solution.

A six-session training course for retail appliance salesmen

There is available an easy-to-use, easy-to-know, six-session sales training course for retail appliance salesmen, including the utility appliance salesmen and the dealer appliance salesmen. And don't discount the importance of the dealer appliance salesmen; nationally they account for almost 90% of the major appliance sales.

The new course employs the time-tried and proved principles of the original EEI Basic Course, but has the single purpose of training retail appliance salesmen.

It's easy to use because the selling sequences are based on appliance sales. It's interesting to the trainee because the selling sequences generally revolve about the big ticket items that should be selling every day.

The *first* unit stimulates interest in the opportunities for appliance salesmen, establishes a pattern for successful selling, and develops interest in the other five sessions.

The *second* unit of the course, like the second unit of the original basis course, deals with buying decisions — need, solution, assurance and value.

The *third* shows how to use the buying motives — comfort and convenience, health and safety, pride and prestige, profit and economy — to sell some appliances.

The *fourth* session swings into prospecting — primarily floor prospecting. A study made in one town by Dan E. Clark & Associates showed that, on the average, appliance salesmen only took three of nine positive steps with each prospect, and gave them a 33% rating for sales efficiency.

Here are some of the revelations from the study: When all of the floor salesmen were idle—not one of them busy with a customer—on the average it took almost two minutes be-

to Page 58 →

Refrigeration equipment manufacturers meet in White Sulphur Springs

THE 17th annual meeting of the Refrigeration Equipment Manufacturers Association was held at The Greenbrier, White Sulphur Springs, West Virginia, March 26-28.

Dube elected president

John E. Dube, president, Alco Valve Company, St. Louis, Missouri, was elected president of REMA at the annual board of directors meeting held on the first day of the annual meeting. He succeeds W. A. Siegfried, president, Superior Valve & Fittings Company, Pittsburgh, Pennsylvania.

L. C. McKesson, vice president in charge of sales, Ansul Chemical Company, Marinette, Wisconsin, was elected vice president.

Also elected were Lud Emde, president, Temprite Products Corporation, Birmingham, Michigan, treasurer; and James Emmett, Jr., vice president, James P. Marsh Corporation, Skokie, Illinois, secretary.

These new officers, with W. A. Siegfried, retiring president, become the Executive Committee of REMA for the Association's fiscal year beginning May 1.

Elect new directors

Newly-elected directors of the Association include:

Cecil Boling, The Bush Manufacturing Company, West Hartford, Connecticut; A. J. Defino, Fedders-Quigan Corporation, Buffalo, New York; W. F. Bakke, Sub-Zero Freezer Company, Inc., Madison, Wisconsin; A. M. Esberg, Eston Chemicals, Inc., Los Angeles, California; and F. G. Coggin, Detroit Lubricator Company, Detroit, Michigan.

L. C. McKesson, of Ansual Chemical Company, Marinette, Wisconsin, was reelected for a 3-year term as director-at-large.

Others continuing to serve on REMA's Board of Directors are: H. M. Brundage, General Electric Company, Bloomfield, New Jersey; John E. Dube, Alco Valve Company, St. Louis, Missouri; J. A. Dugan, Bundy Tubing Company, Detroit, Michigan; Lud Emde, Temprite Products Corporation, Birmingham, Michigan; James Emmett, Jr., James P. Marsh Corporation, Skokie, Illinois; J. W. Krall, Tyler Fixture Corporation, Niles, Michigan; W. A. Siegfried, Superior Valve & Fittings Company, Pittsburgh, Pennsylvania; W. F. Switzer, Frigidaire Division, General Motors Corporation, Dayton, Ohio. L. W. Larsen, Sales Manager, Refrigeration Division, Tecumseh Products Company, Tecumseh, Michigan, was appointed to fill the unexpired 2-year term of R. L. Sears, who resigned from the Board.

Advisory members of the Board of Directors, made up of past presidents, are: E. A. Vallee, Vice President, A-P Controls Corporation, Milwaukee, Wisconsin; R. H. Luscombe, Sales Manager, Penn Controls, Inc., Goshen, Indiana; H. F. Spoehrer, Vice President, Sporlan Valve Company, St. Louis, Missouri; E. M. Flannery, Vice President, The Bush Manufacturing Company, West Hartford, Connecticut; H. F. Hildreth, Manager, Refrigeration Specialties Department, Westinghouse Electric Corporation, Springfield, Massachusetts; K. B. Thorndike, Vice President, Detroit Lubricator Company, New York, New York, and R. H. Israel, Sales Manager, Virginia Smelting Company, West Norfolk, Virginia.

W. Vernon Brumbaugh continues as executive secretary. General Headquarters of the Refrigeration Equipment Manufacturers Association are located in Washington, D. C.

Newly-elected officers of REMA, left to right: James Emmett, Jr., secretary; John E. Dube, president; W. A. Siegfried, retiring president; L. C. McKesson, vice president; Lud Emde, treasurer.

THE finish LINE

HOW WHITE IS WHITE — as a rough way of stating a question that has been existing concern among the producers of all types of metal finishes, the manufacturers of all kinds of finished metal products and the consumer users of the finished products for a good many years.

To state the problem simply and from the practical standpoint we raise the question: "Can white finishes for metal products generally used in groups (kitchen appliances for example) be standardized for color characteristics as the consumer-user sees them?" We believe that the answer can and should be "yes." At the same time we hasten to comment that the problem is not as simple as it appears in print and that the solution will be one that calls for the combined use of available technical skills and a spirit of cooperation between all of the segments of industry that are involved.

A technical and practical problem

If we were to start a discussion of the technical problems involved we would be using such terms as spectrophotometer, reflectometer, diffuse and specular reflectance, Munsell notations, hue, value, chroma and other technical designations that need not be included in a strictly "practical" remarks but need to be included in a strictly "practical" evaluation of the problem.

We have received inquiries at **finish** from companies, large and small, concerning an existing source for a stated and white that individual finished product manufacturers could substantially use for their own benefit and for the convenience of the final customer.

These inquiries raise two questions: (1) should white for metal products — particularly appliances for kitchen and laundry — be standardized, and (2) is there a technical and practical solution to the question of standardizing white finishes?

In our opinion, it should be possible to come up with an affirmative answer for both of the questions. However, we are not primarily interested in our opinions. We are interested in determining the degree of interest in the problem, the possibility for getting action, and the chance for cooperation among metal products manufacturers, particularly those making major appliances.

Work has been done

We would be remiss in opening the question editorially if we failed to report the fact that considerable work has been done by important technical men in the appliance and finishes field over a period of years.

Some progress has been made by individual manufacturers in attempts to standardize white for appliances of their own make which are to be used together.

Some cooperative work has been carried out during recent years by technical representatives of major appliance producers and from the suppliers of both organic and ceramic finishes.

The National Electrical Manufacturers Association has a "Joint Sections Committee on Color of Kitchen Appliances" which has held productive meetings and appears to be nearing an approach to the problem.

Another opportunity for cooperation

It will be evident even if it is determined that white standardization is needed and wanted — and that it can be technically and practically accomplished — that even then there will be the question of cooperation by the majority of important manufacturers before the assumed ultimate benefits will accrue to producers and consumers.

We will make the same offer that was made in connection with the now eminently successful National Safety Council Program when the cooperative plan was first suggested by **finish**. We will help by offering an editorial consulting board for ideas and opinions and for promoting a standardization if and when it is proved to be desirable and practical.

Any **finish** reader interested in this problem is encouraged to express an opinion. Just state whether it represents a personal or a company opinion when you write.

Dana Chase
EDITOR AND PUBLISHER

17

for cooperation among metal products manufacturers, particularly those making major appliances.

Work has been done

We would be remiss in opening the question editorially if we failed to report the fact that considerable work has been done by important technical men in the appliance and finishes field over a period of years.

Some progress has been made by individual manufacturers in attempts to standardize white for appliances of their own make which are to be used together.

Some cooperative work has been carried out during recent years by technical representatives of major appliance producers and from the suppliers of both organic and ceramic finishes.

The National Electrical Manufacturers Association has a "Joint Sections Committee on Color of Kitchen Appliances" which has held productive meetings and appears to be nearing an approach to the problem.

Another opportunity for cooperation

It will be evident even if it is determined that white standardization is needed and wanted — and that it can be technically and practically accomplished — that even then there will be the question of cooperation by the majority of important manufacturers before the assumed ultimate benefits will accrue to producers and consumers.

We will make the same offer that was made in connection with the now eminently successful National Safety Council Program when the cooperative plan was first suggested by **finish**. We will help by offering an editorial consulting board for ideas and opinions and for promoting a standardization if and when it is proved to be desirable and practical.

Any **finish** reader interested in this problem is encouraged to express an opinion. Just state whether it represents a personal or a company opinion when you write.

Dana Chase
EDITOR AND PUBLISHER

17

How we

opinions of [illegible] **"hom**

McCall's

To *Finish:*

During the last month I have made [several] eral kitchen installations. In two ca[ses] appliances from several manufactur[ers] were used. They were all white; but [as] are quite right, the whites varied fro[m] blue-white to a creamy-white. Such v[ari]ations detract from the appearance o[f] kitchen and when you consider the c[ost] of appliances today and kitchen remo[del]ing, it is unfortunate that whites c[an]match perfectly.

Mary Davis Gillies
Houses and Home Fashions Ed[itor]

Good Housekeeping

To *Finish:*

All of us here in the appliance division expressed our opinions of the problem posed in your letter, and we don't see how anyone could possibly come up with any other answer than "yes." This, of course, is in reply to your question about the desirability of standardization in white finishes. . . .

We are entirely in favor of standardization of color wherever it can be accomplished.

Helen W. Kendall
Director
Appliances and Home Care

Woman's Home Companion

To *Finish:*

I am quite sure, through the many, many contacts I have had with homemakers throughout the state of New Jersey and through a national magazine, that homemakers would be delighted if it were possible to purchase all major appliances used in the kitchen and laundry in a standard white color, instead of the varying shades of white which are available now. . . .

I realize the production of a single standard white color has not been easy to accomplish, that for years many manufacturers of major home appliances have been troubled with the problem of varying shades of whites. When the single standard white color becomes a reality, it will be an improvement that many of us have long been waiting for.

Ada Bessie Swann
Equipment Consultant

Electrical Merchandising

To *Finish:*

It would seem to me to be obvious that there would be many advantages in standardization on a single white shade. We know that, despite the fact that several major appliance manufacturers produce complete lines of ranges, water heaters, freezers, refrigerators, dishwashers and laundry equipment, all finished in the standardized white of their own, that customers buying individual pieces of equipment are more than usually inclined to favor the products of different manufacturers.

To the customer, white is white, and only when a new appliance is added to the kitchen or laundry, and is found to be a different shade from the appliance installed, does the appreciation come that there are variations. . . .

Laurence Wray
Editor

e is white?

presentatives of merchandising "home" magazines

Editor's Note:

finish **readers (management, sales management, engineers and plant men) may get, from the letter excerpts on these pages, opinions of many of the top editors and writers representing the merchandising and "home" magazines. These observations also may reasonably be expected to reflect the thinking of the purchasers and users of major home appliances.**

One qualifying point should be mentioned. If space permitted publication of the complete text of the letters it would be observed that a number of these editorial representatives do not consider the present degree of variation in whites to be a serious problem, although in every case standardization is favored.

As explained in our opening editorial of the "color" subject, *finish* will publish opinions and comments from all sources and act as a "sounding board" for the technical progress and practical achievements relating to the standardization of white finishes.

It is hoped and expected that the ultimate result, resulting from industry cooperation, will be a "meeting of the minds" which will be beneficial to all.

Parents' Magazine

Finish:

I definitely agree that it would be advantageous from the homemaker's point of view if she were able to purchase the major home appliances, as well as kitchen and laundry equipment, in a standardized white — regardless of manufacturer.

As you may already know, the largest market for kitchen and laundry equipment is among young families with growing children. Very often their major purchases are made progressively as the family grows and finances permit. Under existing conditions, it is seldom possible to replace a damaged part and be assured of replacing it with the same shade of white. Certainly, it would be highly desirable if the homemaker could be assured of buying, say an automatic washer this year, and then next year buy an automatic dryer and have the whites match. I believe it to be a helpful selling tool rather than a deterrent.

Maxine Livingston
Family Home Editor

The American Home

To *Finish:*

I think it would be very advantageous for the homemaker if it were possible for her to purchase major appliances for her kitchen and laundry in a single, standard white color, instead of the many varying shades of white now produced by different manufacturers.

I believe your good magazine, "Finish," has done an outstanding job in trying to unify these shades, but there is still room for improvement. Even though a purchaser may buy a complete line from one manufacturer there is often a variation in the white color.

Edith Ramsay
Home Equipment Editor

Woman's Home Companion

To *Finish:*

In reply to your letter regarding a single standard white color for appliances, I think that there are many times when this would be very helpful. I haven't had any complaints from readers, nor have I heard much discussion about this from homemakers.

However, at times I have had difficulties in photographing at the studio because ranges and refrigerators are usually bluer than some of the cabinets. I have also observed this in some of the kitchens which were a few years old. At the time I thought that cabinets had yellowed and that the appliances were probably a little newer. It's quite likely that they were never the same color in the beginning.

Bernice Strawn
Home Equipment Editor

Everywoman's Magazine

To *Finish:*

It would seem logical and, in fact, practical for all home appliances, standing side by side in a kitchen or laundry, to be of the same shade of white whenever possible. However, as I understand it, there has been a great deal of effort made to standardize the white color, but because of processing methods, this has not been possible.

Every homemaker takes a great pride in a sparkling, fresh-looking kitchen or laundry, and looks at her appliances with a real critical eye. I have heard women say they wished that the cabinets and appliances were the same shade. . . .

Prudence Dorn
Food and Equipment Editor

Electrical Dealer

To *Finish:*

We certainly support your movement to standardize on a single white in the manufacture of all appliances and cabinets to be used in home kitchens and laundries. Obviously the great mass of American appliance buyers purchase one unit at a time. If standard white is used throughout the industry, the homemaker will certainly benefit through more attractive kitchens and home laundries, components of which may be purchased from different manufacturers over a period of years.

Willard Johannsen
Editor

FOR DEFENSE OR CIVILIAN PRODUCTION... *New Monarch* IS READY TO DO ITS PART

In supplying **FIRST QUALITY** Steel Stampings, sub-assemblies, or the finishing of any sheet metal parts necessary to keep your production lines running smoothly —New Monarch is fully prepared to do its share in the present emergency.

Regardless of whether your requirements are for large, intricate stampings or the smaller, more simple kinds, you'll find New Monarch's three expansive, well equipped plants fully qualified to serve you—promptly, efficiently and with utmost economy.

The accumulated benefits of our 45 years of progress in the die and stamping field and the familiarity with government requirements we acquired during the late war make us your logical recourse in your production difficulties.

Scrap is needed for national defense. Turn in yours today.

LOOK to New Monarch for all your stamping needs. Send blueprints for estimates.

When in need of Stampings See...

MONARCH QUALITY

NEW MONARCH MACHINE & STAMPING CO.
406 S.W. NINTH STREET — DES MOINES 9, IOWA

Shown is a small portion of the exhibit space at the ASTE exposition at International Amphitheatre.

Tool engineers meet in Chicago

record attendance at exposition sponsored by American Society of Tool Engineers

A RECORD total of 38,110 persons from industry registered and visited the ASTE exposition held at the International Amphitheatre, Chicago, March 17-21.

Sponsored and operated by the American Society of Tool Engineers, the exposition was built on the theme of "Tooling for Security" — considering both the military and economic phases of security problems.

Over 400 exhibitors participated and demonstrated some 20,000 industrial products from machine tools to gages, machine controls and accessories, presses, dies and fixtures, etc., valued at an estimated $18,000,000.

Among the exhibitors were 100 suppliers of machine tools, 75 builders of presses and materials forming equipment, 70 cutting tool manufacturers, and 40 grinding equipment makers. Precision Control Hall, where displays of inspection and quality control equipment were brought together, had more than 100 exhibitors.

The emphasis that suppliers of production equipment are placing on development of machines and devices that supplant human labor was evident in many of the exhibits. Automatic punch press loading devices, hopper-fed automatic assembly machines, automatic gaging and sorting machines, fast bar feeds, and air and hydraulic powered machine accessories, were among the hundreds of displays of this type of equipment.

Elect new officers

New officers, elected at the Society's 20th annual meeting, include:

President, Leslie B. Bellamy, Detroit manager, Sterling Grinding Division, Cleveland Quarries Company. He succeeds J. J. Demuth, of the National Production Authority.

L. B. BELLAMY, ASTE PRESIDENT

1st Vice President, Roger F. Waindle, director of research, The Nugent-Sand Company, Inc., Muskegon, Mich.

2nd Vice President, Joseph P. Crosby, vice president, The LaPointe Machine Tool Company, Hudson. Mass.

3rd Vice President, Dr. Harry B. Osborn, Jr., technical director, Tocco Division, The Ohio Crankshaft Company, Cleveland.

Treasurer (re-elected), Howard C. McMillen, plant manager, Philco Corporation, Bedford, Indiana.

Secretary, H. E. Collins, chief production engineer, Hughes Tool Company, Houston, Texas.

Ass't Sec-Treas., Gerald A. Rogers, Rudel Machinery Company, Ltd., Montreal, Canada.

Harry E. Conrad, of Detroit, is executive secretary of ASTE.

Technical sessions

Forty-five technical sessions, including panel discussions, vied with the exhibits for attendance. Many of the sessions had audiences well beyond the 500 mark. Plant tours had to be greatly expanded to a total of 53 to accomodate the demand for inspection of manufacturing opera-

tions in Chicago area plants.

Electroforming process meets military needs

Electroforming, a process used to make fountain pen caps and musical instruments, is now being applied to produce parts for military equipment, revealed Dr. C. L. Faust and W. H. Safranek, of Battelle Institute, Columbus, Ohio.

The electroforming process is a method by which a thick layer of metal is deposited electrically on a form that is later removed from the shape, they explained. Typical military parts now produced by this method include 6-foot diameter searchlight reflectors, 15-foot radome molds, electro-clad bearings, radar feed horns, and computing machine components.

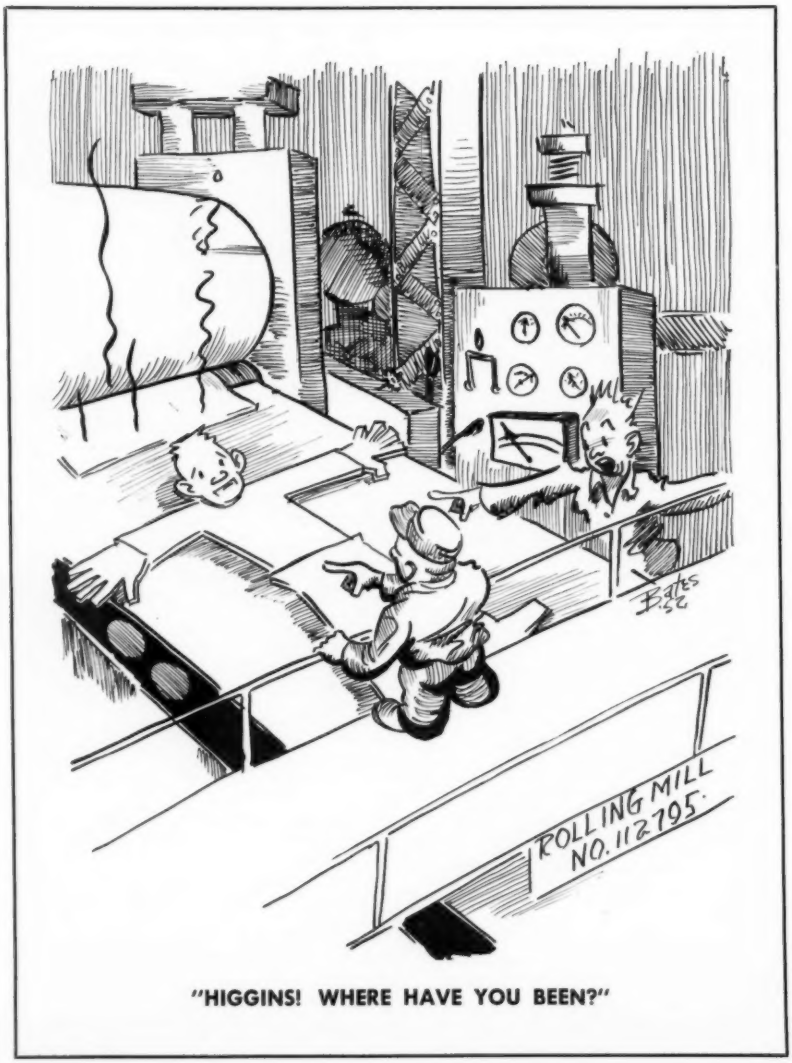
An important current advantage of the process is that it conserves critical materials because parts can be produced to finished size, requiring little removal of excess material to complete them.

Low-cost blanking dies can speed tooling

Tooling can be speeded by the temporary use of metal stamping dies that cost half as much as permanent-type dies, reported to R. C. Berliner, president, C. D. Cash Mfg. Co., Chicago.

Berliner stated that his own company had made up such temporary dies from parts of standard die sets. Further cost reduction has been achieved, he added, by also standardizing on die mountings. The total number of pieces that can be produced by these dies is limited only by the speed of the operation, he added.

Progressive-type and compound-type permanent blanking dies used for long-run production were also described by Berliner. Compound dies, used to produce flat sheet metal blanks, can cost less than progressive dies for the same job. This is due, he said, to the fact that compound-type dies are smaller and more compact.



"HIGGINS! WHERE HAVE YOU BEEN?"

Small vacuum tube used to inspect defense parts

Details of an instrument to meet a critical inspection problem on ordnance and aircraft equipment were described by three engineers from the General Motors Research Laboratories, Detroit.

In a joint paper, A. F. Underwood, head; J. B. Bidwell, assistant head; and J. H. Brems, research engineer, of the GM Laboratories mechanical engineering department, disclosed that surface roughnesses as small as a millionth of an inch can now be checked with a compact light-weight portable instrument.

Chief element of the new device is a vacuum tube only 5/16 of an inch in diameter and one inch long. The elements within this vacuum tube can be moved relative to each other. When so moved, the voltage rapidly changes. The movement is produced by a well-protected diamond stylus which is drawn by hand across the surface to be checked, and which is connected to the tube through a liquid of high viscosity.

The new instrument is expected to solve the problem of maintaining interchangeable roughness standards on parts for defense items produced in different plants. The instrument can be used on flat, curved, and double-curved surfaces.

Surface roughness standards

Dr. C. R. Lewis, staff engineer, Chrysler Corporation, revealed that satisfactory standards by which to check surface roughness on parts produced by anyone have been developed as a result of cooperative action by Chrysler, General Motors, and U. S. Rubber. *to Page 59* →

Cleveland filtration plant features porcelain enamel murals

TWO huge 8′ 6″ x 5′ sectional murals adorn the walls of the administration building of the new Nottingham filtration plant in Cleveland, Ohio. The plant itself was over five years in building, and cost $22,000,000.

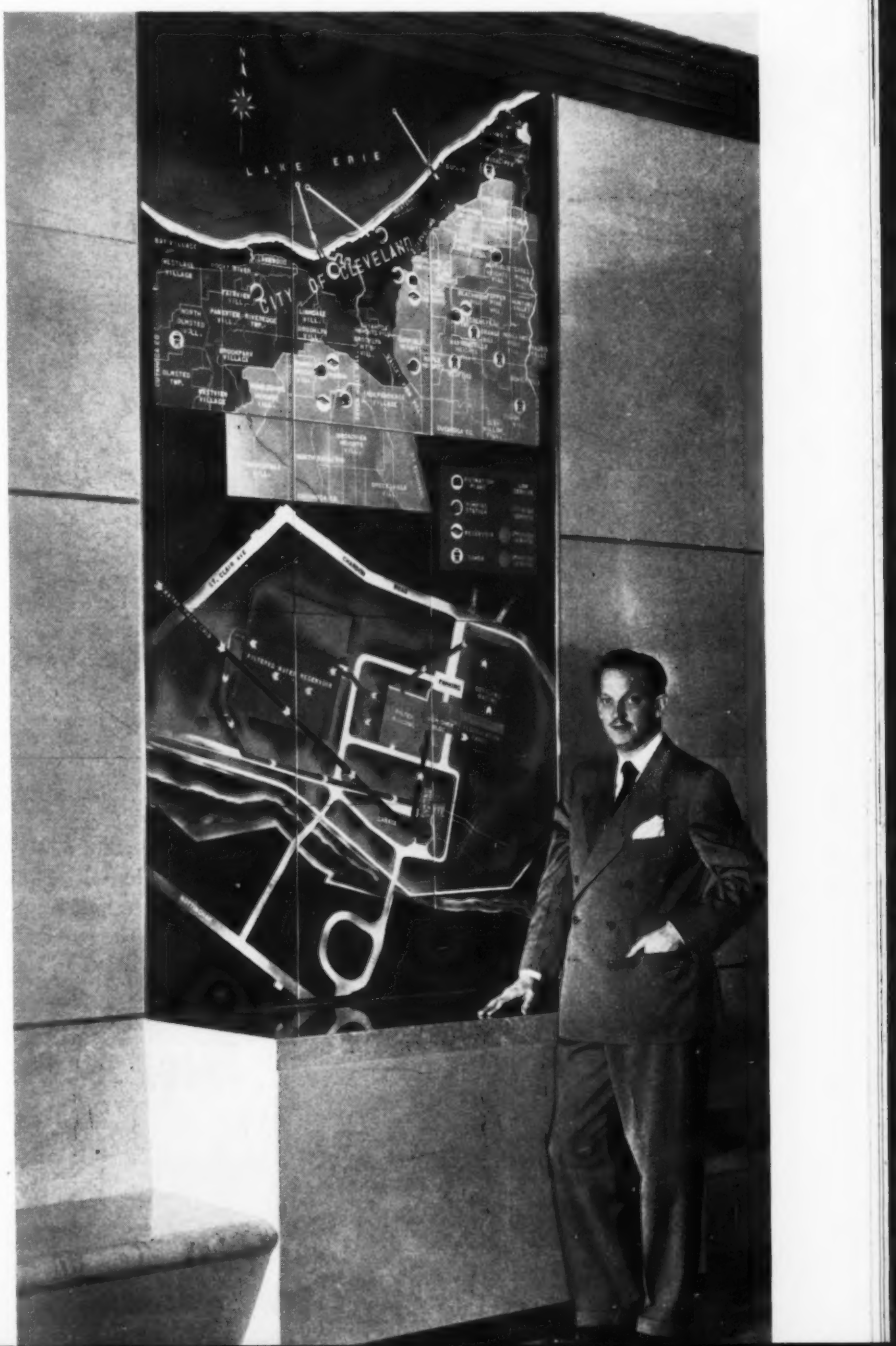
The murals were designed and executed by H. Edward Winter, nationally-known enamel mural artist. The murals were in process more than a year and a half in the Ferro Corporation laboratory.

Each mural is composed of 15 flanged sections, 20″ x 21″ each. Each panel was fired 12 times at 1500° F., and in order to keep the colors first applied from burning away in so many firings, Winter stated that he gave the first six firings at 2½ minutes instead of the customary 3 minutes.

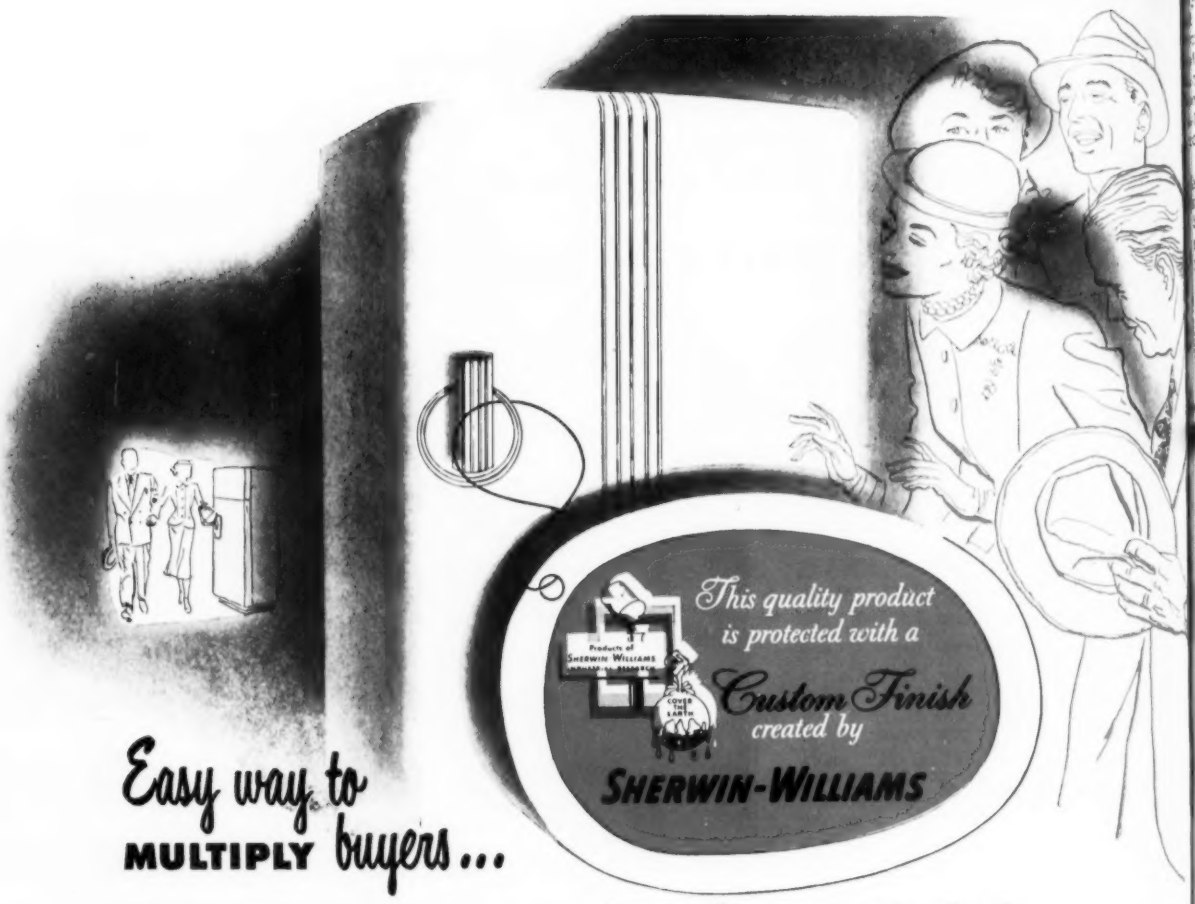
The subject matter is handled in simplified diagrammatic manner to serve an educational as well as beautiful purpose to those who view them. It is expected that thousands of school children will view these murals on their tour-of-inspection trips throughout the plant.

One mural (shown at right) shows the map of the City of Cleveland and its suburbs that are serviced by the filtration plant. Lake Erie is at the top with the three cribs marked with red dots. The lower part of the same mural shows a schematic plan of the plant itself, the building, settling basins, mixers and pumping stations. The path of water coming from Lake Erie is shown circulating throughout the plant marked plainly with white arrows.

The mural on the opposite wall also depicts diagrammatically the actual steps in the filtering process of the water flowing from the crib until it reaches homes, industry and commerce. Colors used in the murals are dark brown, olive green, lemon yellow, chartreuse, blue, white and black.



Right: H. Edward Winter, nationally known artist, is shown with one of two murals he executed for the Nottingham filtration plant.



Easy way to MULTIPLY buyers...

KEMGLAD®—THE "WHITE-FOR-LIFE" APPLIANCE FINISH

Food acids . . . spattered grease . . . even household chemicals won't mar the lasting beauty of these widely used Sherwin-Williams Appliance Finishes! Investigate what these advanced technical developments in synthetic resin finishes for appliances and metal products can offer you. Call, wire or write.

ADD the sales appeal of the BEST-KNOWN NAME IN FINISHES!

ONE good name deserves ANOTHER!

The Sherwin-Williams name, identifying the quality finish on a quality product, contributes the added sales appeal of the best-known name in finishes . . . a trade-mark known round the world as a symbol of good finishes!

That's why market-minded appliance manufacturers, more and more, are looking to Sherwin-Williams Custom Finishes to meet their requirements . . . and to provide an added sales advantage with tags identifying the finish on the completed product.

Ask your Sherwin-Williams Industrial Representative for details about the identification aids available to users of Sherwin-Williams materials, and the sales advantages they offer—or write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

ADMIRAL TO BEGIN HOME FREEZER PRODUCTION IN FALL

Production of a full line of home freezers will begin next fall, it was announced by Lee H. D. Baker, vice president in charge of the appliance division, Admiral Corporation.

Ranging in size from 9 cu. ft. to 20 cu. ft., in both chest and upright models, the freezers will be produced by Admiral's Midwest Manufacturing Division, Galesburg, Illinois, and by Seeger Refrigerator Co., St. Paul.

CERAMIC ENGR. JOINS RYAN

Ryan Aeronautical Company, San Diego, has appointed Alexander Pechman, ceramic engineer, to the staff of its development laboratories. Pechman is a graduate of North Carolina State College.

JAMES NAMED CHAIRMAN OF AHLMA WASHER DIVISION

R. P. James, director of sales, Speed Queen Corp., Ripon, Wis., and a member of the executive board of the American Home Laundry Manufacturers Association, has been named chairman of the conventional washer division to succeed Frank W. McGrath, of Alliance, Ohio, who resigned.

It was announced also that Frank Breckenridge, president of Automatic Washer Company, Newton, Iowa, has been appointed to fill the consequent vacancy on the AHLMA executive board and to serve as conventional division vice chairman. John W. Ward, advertising manager, The Dexter Company, Fairfield, Iowa, was named to the AHLMA conventional washer committee.

GEORGE MITCHELL, PRESIDENT OF GAS ASSOCIATION, DIES

George F. Mitchell, president of the American Gas Association and president of The Peoples Gas Light and Coke Company, Chicago, died March 26 at the age of 64.

Long active in executive affairs of the American Gas Association, Mitchell served on many important AGA committees, including the executive committee and the executive board. He was elected president of the Association on October 17, 1951, at the annual convention held in St. Louis.

RCA ENTERS ROOM COOLER, DEHUMIDIFIER FIELDS

The RCA Victor Division, Radio Corporation of America, Camden, N. J., is supplementing its new line of room air conditioners with an electric dehumidifier, it was announced by Robert A. Seidel, RCA Victor vice president. The dehumidifier is designed principally for domestic use, but is suitable for many commercial establishments, it was stated.

COPELAND NAMES CHIEF ENGR.

Appointment of Raymond G. Mozley, formerly with Hussmann Refrigerator Co., St. Louis, as chief laboratory engineer of Copeland Refrigeration Corp., Sidney, Ohio, was announced by W. G. von Meyer, sales manager.

SOLAR NAMES ASS'T P. A.

D. A. Perkins has been appointed assistant purchasing agent, Solar Aircraft Company, San Diego.

SERVEL NAMES CHIEF ENGR. FOR ROOM COOLERS

John H. Jennings has been named chief engineer of the new room air conditioner division of Servel, Inc., it was announced by W. Paul Jones, president. For the past seven years, Jennings was chief engineer of Mitchell Mfg. Co., Chicago, manufacturers of room air conditioners.

NEMA FREEZER SALES SET NEW RECORD IN '51

A record total of 738,328 farm and home freezers were sold during 1951 by 25 manufacturers reporting to the National Electrical Manufacturers Associations. (This includes 15,445 units sold outside the United States.) This figure is 14% higher than the previous high sold in 1950.

However, Larry C. Blunt, of International Harvester Company, and chairman of the NEMA Farm and Home Freezer Section, told the National Frozen Foods Conference, in Chicago, that an over-all total of 1,050,000 freezers were sold in 1951. He added that annual sales of freezers have increased 500% since 1946.

AHLMA NAMES CASTNER NATIONAL COUNSELLOR TO U. S. CHAMBER OF COMMERCE

George P. Castner, general manager, Beam Manufacturing Co., Webster City, Iowa, and past president of the American Home Laundry Manufacturers Association, has been appointed national counsellor from AHLMA to the Chamber of Commerce of the United States. Roy A. Bradt, vice president, The Maytag Company, Newton, Iowa, was named an alternate.

No. 471 is a new and important link in zinc-die-cast metal cleaning sequences.

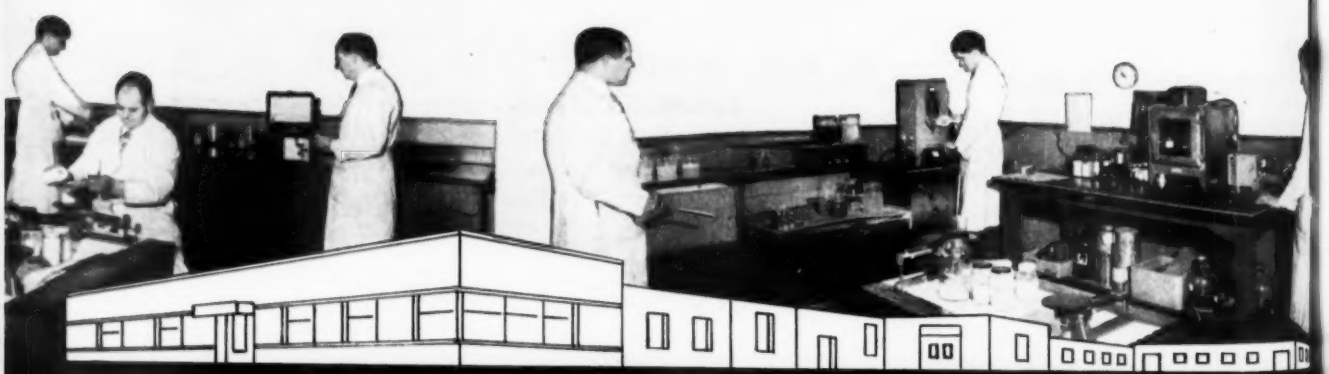
No. 471 is a cleaner in the middle-range of alkalinity which has found wide acceptance as a secondary soak cleaner for zinc-base die castings. Its outstanding features are:

1. Clear solution—no precipitation in hard water.
2. No drying stains, easy rinsing, as high as 190° operating temperature.
3. Will not dull or darken the lustrous finish.
4. Provides excellent wetting of both buffed and as-cast surfaces.

These features account for the rapid rise in sales of cleaner No. 471.

Send for complete information and 24-page brochure that describes all of Northwest products.

1951-1952 growth of NORTHWEST CLEANER Number 471 . . . in Sales Volume



LO pH HI

NORTHWEST CHEMICAL CO.
9310 ROSELAWN DETROIT 4, MICH.

pioneers in pH cleaning control—serving you since 13

AES MOVES OFFICES

The executive offices of the American Electroplaters Society have been moved to the American Building, 445 Broad Street, Newark 2, New Jersey.

PEI OFFERS ASSISTANCE ON FINISHING PROBLEMS

All industries working with, or producing, metal products are now being offered free assistance in their metal finishing or coating problems as a special service of the Porcelain Enamel Institute, Washington, D. C.

A special committee, known within the Institute as the New Uses Committee and headed by C. P. Lohman, an industry authority, has been established for the purpose of researching new applications for porcelain enamel and to provide the consulting, technical, or developmental assistance that any metal product manufacturer may need in testing porcelain enamel as his product finish.

The new service of the committee will provide manufacturers of metal products with an opportunity to obtain counsel regarding the applicability of porcelain enamel to specific finishing problems, specialized information regarding design and metal fabrication to adapt a product to porcelain enameling, technical assistance concerning the type of porcelain enamel required for various types of services, including resistance to high temperatures, thermal shock, corrosive influence, abrasion, durability under various types of services, and the marketability added by proper use of the durability, color, and easy cleanability of porcelain enamel.

SERVEL NAMES HAINSWORTH, RUNDELL TO TOP ENGR. POSTS

In connection with expansion of the top level engineering staff of Servel, Inc., Evansville, Indiana, W. Paul Jones, president, has announced the appointments of Dr. William R. Hainsworth as staff consulting engineer to direct long-range engineering programs in all fields, and Theodore W. Rundell as vice president in charge of engineering.

Dr. Hainsworth, who has been vice president in charge of engineering, will continue as a vice president. Rundell was formerly chief refrigeration engineer for Philco Corporation.

W. W. GALBREATH DIES

W. W. (Gal) Galbreath, associated with the stamping and enameling industries for many years, died March 11 at the age of 69.

Mr. Galbreath was president of The Youngstown Pressed Steel Company, Warren, Ohio, from 1918 until 1933, when he resigned to assume the presidency of Alliance Porcelain Products Co. (now Alliance Ware, Inc.), Alliance, Ohio.

In 1942 he retired from active business and was the executive vice president of the Pressed Metal Institute during its reactivation in 1943. During World War II, he worked with the War Production Board. He joined the National Production Authority staff during the summer of 1951, resigning in the fall.

GEOFFREY F. MORGAN DIES

Geoffrey F. Morgan, author and lecturer, died recently at his home in Santa Monica, California.

Finish was privileged to publish three articles by Mr. Morgan. They were "*The Machine Age — Blight or Blessing?*", December 1944; "*The Public Be Served!*", July 1945; and "*The Cost of High Living*", December 1945.

W. E. MATHEWS DIES

Walter E. Mathews, assistant factory superintendent, Benjamin Electric Mfg. Co., Des Plaines, Ill., died March 22 at the age of 66. He had been with the Benjamin organization since 1916.

RYAN, CAMEO MERGE CERAMIC COATING ACTIVITIES

Climaxing two years of coordinated production and testing of ceramic coated parts for high-temperature aircraft applications, Ryan Aeronautical Company, San Diego, and California Metal Enameling Company, Los Angeles, have announced they have combined their activities in this field. The new arrangement combines Ryan's experience in making heat- and corrosion-resistant sheet metal parts with Cameo's half-century ceramics production experience.

The new agreement between Ryan and Cameo provides that the companies will jointly finance a continuing program of research in the improvement of high temperature ceramic coatings and their methods of application. Carried on by the two laboratories, this work will continue the mutual development program which has been in progress since the beginning of the first experiments two years ago. (*See "Ceramic Coating Makes the Big Time in the Air-*

Hugh Penton (right), vice president, California Metal Enameling, confers with Wilson Hubbell, chief metallurgist, Ryan Aeronautical.

craft Field" and "Ceramic Coatings for the Hot Spots," November 1951 finish.)

DRYOMATIC NAMES HEINZ PRES.

Dryomatic Corporation, Alexandria, Va., manufacturers of automatic household and industrial dehumidifiers, has announced the election of Winfield B. Heinz as president. It was also announced that Anthony Hass was promoted to vice president of sales.

Heinz, also owner of Heinz Engineering Co., Arlington, Va., previously was connected with General Electric, American Cyanamid, and the operations research office of Johns Hopkins University.

PAINT FEDERATION CLUB MOVES INTO NEW OFFICE

New offices of the Federation of Paint and Varnish Production Clubs are located at 121 South Broad Street, Philadelphia 7, Pa., a location in the heart of the city's business district.

ELECTROCHEMICAL SOCIETY 50TH ANNIVERSARY, MAY 4-8

The Electrochemical Society will celebrate its 50th anniversary by returning to its birthplace in Philadelphia, May 4 through 8, for the spring meeting at the Benjamin Franklin Hotel. The Society's first meeting was held in Philadelphia in April, 1902.

This year over 125 technical papers have been scheduled for the meeting, which promises to be the largest in the Society's history. A feature on the technical program will be a special round-table discussion on "The Teaching of Electrochemistry."

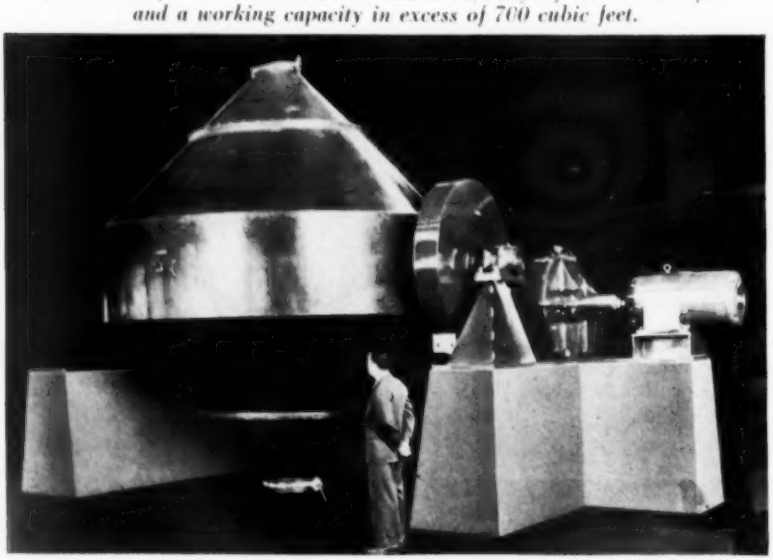
Man-sized metal treatment installation — *has been placed in operation at Texas Engineering & Mfg. Co., Dallas. It is reported to be the largest anodizing, alodining and chromodizing installation in the southwest — consisting of six 5500-gallon processing tanks.*

YODER OPENS N. Y. OFFICE

The Yoder Company, Cleveland, leading manufacturer of electric-weld tube mills, cold roll forming and slitting machinery, has opened an office at 11 West 42nd Street, New York City.

Robert H. Brinker, previously with the firm's Cleveland office, is in charge of the new office which will handle sales in New England, Southern New York, and Atlantic Coast territory down to and including Washington, D.C.

Largest conical blender in the world — *was recently completed by The Patterson Foundry & Machine Co., East Liverpool, Ohio. Unit is 13 feet in diameter, and has a capacity of 1000 cubic feet and a working capacity in excess of 700 cubic feet.*



VERSON NAMES ANKENEY WORK MANAGER

Verson Allsteel Press Company, Chicago, has announced the appointment of Harry Ankeney as work manager of their Chicago plant. Ankeney has been associated with Verson since 1946, first as electrical engineer and as plant engineer prior to his recent apointment. He is a graduate of Iowa State College, and is a member of the American Institute of Electrical Engineers.

BECHERER HEADS LINK-BELT

Robert C. Becherer, formerly executive vice president, has been elected president of Link-Belt Company, Chicago, succeeding George P. Tor-

rence, who is retiring. Becherer joined Link-Belt in 1923, and was elected executive vice president in 1951.

RHEEM NAMES MGR. OF PLANTS

Harry H. Filler has been named manager of manufacturing for all plants of Rheem Mfg. Co., it was announced by Richard S. Rheem, president. Filler has served in various foreign and domestic posts for Rheem in the past 18 years.

SERVEL EMPLOYMENT UP 75% FOR FIRST QUARTER

Employment at Servel, Inc., Evansville, Indiana, increased more than 75% during the first quarter of this year, according to W. Paul Jones, president.

Compared with 4590 employees last December, latest Servel figures indicated that more than 8100 persons are now on the company's payroll, with between 1500 and 2000 more employees to be added as production of F-84 Thunderjet fighter plane wings and cartridge cases is increased, said Jones.

BARBER-COLMAN BUYS WHEELCO

Barber-Colman Company, Rockford, Illinois, is reported to have purchased the principal assets of Wheelco Instruments Company, Chicago. Wheelco operations will continue in Chicago for the present, but eventually will be transferred to Rockford, it was stated.

AMERICAN CHEMICAL PAINT COMPANY
AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: PROTECTING ALUMINUM WITH ALODINE®

ALODIZING IS EASY AND EFFECTIVE

The Alodizing process is a chemical one and does not require electrolytic techniques or equipment. Alodizing is simple, foolproof, low in cost, and requires a minimum of equipment. Essentially, the process consists of the following easily controlled operations or steps:

1. Cleaning the work
2. Rinsing the cleaned aluminum surfaces
3. Coating with "Alodine"
4. Rinsing with clean water
5. Rinsing with acidulated water
6. Drying

After treatments. Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" surface.

Flight of the Chance Vought Cutlass, seventh in a line of outstanding fighters and "potentially capable" of flying faster than any other service type jet aircraft in production, land or carrier-based. Substantial surface areas of the Cutlass are constructed of painted Alodized aluminum.

SHORT COATING TIMES AND LOW BATH TEMPERATURES

With the "Alodine" bath at its normal temperature of 120° F., coating time by immersion approximates 1½ minutes and by spraying, 15 to 20 seconds. Coating times and bath temperatures can be varied to suit operating conditions.

"ALODINE" MEETS SERVICE SPECIFICATIONS

"Alodine" applied by immersion or spray complies with the rigid performance requirements of both industrial and Government specifications. The following is a list of Service Specifications which "Alodine" meets at the present time.

MIL-C-5541
MIL-S-5002
AN-F-20
U. S. Navord O.S. 675
AN-C-170 (See MIL-C-5541)
U.S.A. 72-53 (See AN-F-20)
16E4 (SHIPS)

"ALODINE" HAS UNLIMITED APPLICATIONS

Parts can be treated by immersion, by spraying in an industrial washing machine, by flow coating, or by brushing. This means that "Alodine" can be used anywhere, on any part or product made of aluminum. This had led to widespread use of the Alodizing process: 1. by fabricators of aluminum products in all industries to assure the utmost in product protection and finish durability; 2. by manufacturers of aluminum who are supplying Alodized aluminum sheets and coils from the mills.

In general, small size products or parts are processed rapidly and conveniently in immersion equpiment, which can be mechanized if production volume justifies it. For large production of formed parts, or for Alodizing coiled stock, strip, or cut-to-size sheets, a five-stage power spray washer is most convenient. Airplanes, trucks, trailers, housing, railway cars, bridges and other large units are Alodized in a simple brush-on or flow-coat process.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "ALODINE" AND ON YOUR OWN ALUMINUM PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

PAUL CECIL TO SEAPORCEL

Seaporcel Metals, Inc. has announced that Paul S. Cecil, formerly with Strong Mfg. Co., has joined the company as ceramic engineer. M. J. Salton said that Cecil's work will be concerned in part with several Seaporcel research projects.

DADISMAN, WEAVER ON EASTERN ENAMELERS PROGRAM

At the May 17 meeting of the Eastern Enamelers Club, in Philadelphia, Ray Dadisman, of Armco Steel Corp., and president of the Porcelain Enamel Institute, will discuss "Looking Ahead with Porcelain Enamel."

Robert A. Weaver, Jr., of Bettinger Enamel Corp., will follow with an address on "High Temperature Enamel Coatings."

A 30-minute film, "Labrador Railroad by Airlift", will also be shown. The movie is concerned with the project developed to carry iron ore from the new Labrador mines south to the Gulf of St. Lawrence.

PERFECTION ELEC. RANGES ON "STOP THE MUSIC"

Perfection Stove Company is giving away 26 electric ranges as a participant in the "Stop the Music" radio program over the ABC network.

FERRO BUYS INTEREST IN POWDERED METALS FIRM

In order to further diversify its interests, Ferro Corporation is completing arrangements to purchase a 50% interest in Wel-Mat Company, engaged in the business of powdered metallurgy. Wel-Met has plants in Kent, Ohio, and Salem, Indiana.

Powdered metal parts are used in refrigerators, washing machines, aircraft, automobiles, etc.

HUNTLEY NAMED COWLES PRES.

Robert F. Huntley has been elected president of Cowles Chemical Company, succeeding Edwin Cowles, who continues as a director.

Huntley joined Cowles in July 1942, as assistant to the president, and in September of that year was named to the board, and appointed vice president and general manager. In his new post, he will continue with the duties of general manager.

FENTRESS JOINS FOOTE MINERAL

James Fentress, formerly research assistant at Northwestern University, has joined Foote Mineral Company as sales engineer.

Our plants are part of your production line
HOURLY QUALITY CHECKS IN OUR LABS KEEP FIBERGLAS* QUALITY RIGHT ON SPECIFICATION
giving you insulation of uniform high quality.
The universal appliance insulation
FIBERGLAS INSULATION MADE BY
OWENS-CORNING
FIBERGLAS
insulated
OWENS-CORNING FIBERGLAS CORPORATION · TOLEDO 1, OHIO
*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for products made of or with fibers of glass.

NORGE NAMES KOCH TO NEW WOOSTER DIVISION POST

A. F. Koch, manager of the plant of the Norge Division of Borg-Warner, Chattanooga, has been named works manager of the firm's newly-formed Wooster Division, Wooster, Ohio.

The new plant will produce electrically-driven and hydraulic fuel pumps for jet engines.

HOTPOINT USING EXTENSIVE QUALITY EVALUATION PROGRAM

To maintain high standards of quality in kitchen and laundry appliances during period of materials shortages and alternate materials, Hotpoint, Inc. is using an extensive "quality evaluation" program to check performance, durability, and appearance, according to John C. Sharp, vice president of engineering.

PEI ENTERS SECOND PHASE OF CURTAIN WALL PROJECT

Members of the Curtain Wall Research Committee of the Porcelain Enamel Institute have announced the beginning of the second phase of the project.

The initial phase entailed the gathering of information, data and drawings on all known existing work on curtain wall building construction, an analysis of this data, and the segregation of such facts as can be used in connection with further development.

The second phase of the project will cover the actual development and testing of one or several possible means of accomplishing satisfactory curtain wall construction using porcelain enameled steel.

GUNNISON TO MAKE STEEL MILITARY SHELTERS

Gunnison Homes, Inc., prefabricated housing subsidiary of U. S. Steel, is planning to undertake immediate erection of a new plant in Harrisburg, Pa., to prefabricate an insulated steel military shelter perfected following years of research, according to Gen. John J. O'Brien, Gunnison president.

The new steel buildings will follow the Gunnison Homes assembly-line erection and design techniques. They can be used for one or two-story field hospitals, barracks, mess halls, warehouses, post exchanges or administration buildings, said O'Brien.

NESA MOVES OFFICE

The National Electric Sign Association has moved its offices to 141 W. Jackson Blvd., Chicago 4, Illinois. NESA's offices formerly were located at 224 So. Michigan Ave. in Chicago.

PEI SETS ANNUAL MEETING

The annual meeting of the Porcelain Enamel Institute will be held at The Greenbrier, White Sulphur Springs, W. Va., October 22-24, it was announced by John Oliver, secretary of the Institute.

An earlier announcement stated that the PEI Shop Practice Forum will be held at the University of Illinois, Urbana, Illinois, September 10-12.

WHAT NO SPRAY BOOTH?

That's right, with the RANSBURG NO. 2 PROCESS, there's no overspray to be exhausted . . . ventilation of solvent vapor is all that is necessary.

● Spray painting is no longer a hit or miss proposition. With the Ransburg No. 2 Process, it's a science.

Because the coating material is electrostatically atomized (no compressed air used) and electrostatically deposited, costly overspray is eliminated with the No. 2 Process.

In most installations, efficiency is in the high nineties, and in some instances, efficiency exceeds 99%. On most production lines, the No. 2 Process will produce 25% to 75% more pieces per gallon than any other spray finishing system. Efficiency is even greater when compared to conventional hand spray methods.

We will welcome the opportunity of telling you more about the Ransburg No. 2 Process, and what it can do for you in your own finishing department. Write or call.

Electrostatic Painting Processes

RANSBURG ELECTRO-COATING CORP.

Indianapolis 7, Indiana

RANSBURG

CHICAGO ELECTRO-PLATERS INSTITUTE NAMES NEW OFFICERS

Carl F. Hansen, president, Advance Tinning Company, Chicago, has been elected chairman of the Chicago Electro-Platers Institute at the association's 17th annual meeting. He succeeds J. Robert Greenwell, Chrome-Rite Company, also of Chicago.

Lawrence J. Hay, president, Plating Service Company, was elected vice-chairman, and J. M. Westergaard, Metal Processing, sec.-treas.

Elected to the board of directors were John Lietz, B. Mercil & Sons Plating Company; Edward Fell, Atlas Plating Works; Robert L. Giesel, Adolph Plating, Inc.; Charles Jensen, Jensen Plating Works, and John Vermeyen, Crescent Plating Works.

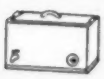
Continuing on the board from 1951 are J. Robert Greenwell and H. E. DeGrenier, Grand Plating Company; and Emil Van Steen, Modern Plating Company.

For melting pots for solder, wax, plastics, etc.

For electric hot water boosters and water heaters.

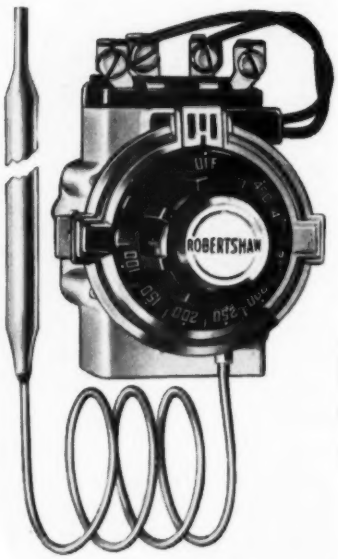
For coffee urns, deep-fat fryers, ovens and cooking equipment.

For automatic heat sealing machinery.


For sterilizers and other applications.

For label dispensers and miscellaneous heating equipment.

a "Workhorse" for accurate, dependable temperature Control!



MODEL D-1

A ruggedly built control of great accuracy and sensitivity for a wide variety of heating applications with a maximum range of 550°F. No separate "off" switch. Mechanism actuated by hydraulic thermostatic element consisting of bulb, capillary tube and diaphragm. Write for Catalog D-1.

In Home and Industry, *Everything's Under Control*

Robertshaw

THERMOSTAT DIVISION
ROBERTSHAW-FULTON CONTROLS COMPANY
YOUNGWOOD, PENNSYLVANIA

VARIETY MACHINE & STAMPING NAMES SALES MANAGER

The appointment of Gerald F. Sindelar as sales manager of Variety

Machine and Stamping Company, Cleveland, O., was announced by Wallace F. Ardussi, president, as part of the company's expansion program.

Sindelar has had many years of sales experience in the metal working industry, and for the past five years was manager of appliance sales for Tinnerman Products, Inc.

Aircraft fabrication

→ *from Page 23*

presses are equipped with blank-holders, or clamping rings, which hold the flat sheet with sufficient pressure to overcome wrinkling but not great enough to cause fractures.

For drawing large skins into smooth, compound contours, a 150-ton stretch press is used. This machine places the metal under tension. It is used to stretch-form the large re-fueling pods for the Boeing KC-97E Stratofreighter aerial tanker. Often the dies are heated internally in order to increase the ductility of the metal.

The big "squeeze"

Severest of all press tasks are squeezing operations. These include extrusion, coining, embossing, stamping, swaging, flattening and sizing, in order of descending severity. Squeezing involves compression, pri-

marily, although some tensile stress is usually present. Punch presses are kept busy flattening exhaust manifold port flanges after they are welded. Transition liner spacers are coined on the same machines to give them the required chamfer. Exhaust system port tubes are swaged on punch presses to reduce their diameters, and outer combustion chambers are embossed in punch presses. Practically all of the press equipment is used in stamping jobs where the dies are struck solidly against each other.

The development of pressed metal machines and techniques is moving ahead rapidly because of the enthusiasm which production experts are showing for larger, single-piece designs. However, another factor is speeding this development. The scarcity of castings and machine tools for machining them is accelerating the switch to rolled steel weldments. Rolled steel structures have strength characteristics which are more uniform and reliable than castings because the grain structure of the metal is more highly refined. Typical examples of this trend are the huge frames for the new presses described in this article, which are made of welded rolled steel plate instead of castings. These expansive industry trends are pushing the capacities of new presses to unprecedented tonnages to handle such heavy duty assignments.

Cost reduction of stampings

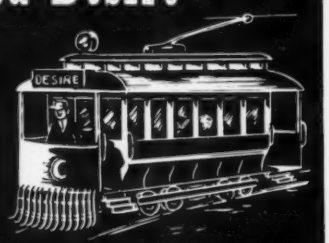
→ *from Page 26*

Then, under the stress of the times, the raising of prices may result in even more unfavorable balances. No upward movement in price levels should ever be proposed until all other means have been exhausted.

On the contrary, low prices not only help to raise the standard of living, but also in many cases result in increasing the profits. If you are sold on the idea that stampings present the ultimate in consumer values (and what job stamper is not), you should make the most of your opportunities. That is a deal that can

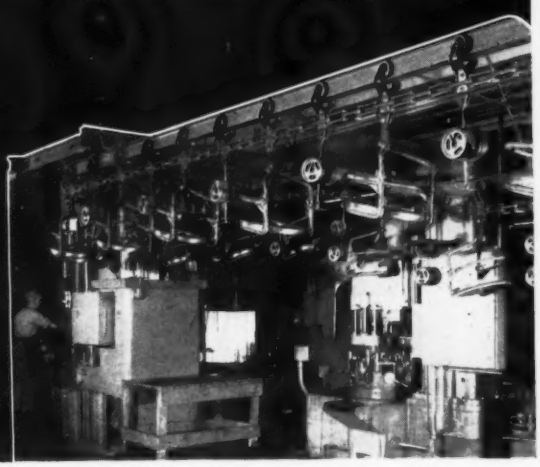
"A Street Car Named Desire"

was FIRST operated by a Trolley



. . . later it became famed as a smash hit of stage and screen. Leaving nothing to "Desire" is the

Rivetless Chain Trolley Conveyor



another FIRST by JERVIS B. WEBB COMPANY

Simple and efficient is the Webb Trolley Conveyor. Its 2 wheel trolleys are suspended on an overhead I beam track and connected by a rivetless chain which serves the double purpose of spacing and driving the trolleys. Webb Trolleys are so simple to assemble to the I-beam or to dismantle that skilled labor is not required. Trolleys are arranged for pressure gun lubrication. Their triple labyrinth seal has 3 walls of steel to keep lubricant in and dirt out. Brackets are drop-forged with hardened steel wheels. Races are precision ground. Due to a lower friction with retainer type bearings the life is longer. The Drop-Forged Rivetless Chain has been designed and perfected by the Jervis B. Webb Company specifically for Trolley Conveyor Systems.

CONVEYOR ENGINEERS AND MANUFACTURERS

JERVIS B. WEBB COMPANY

8913 ALPINE AVE. DETROIT 4, MICH.

OFFICES IN PRINCIPAL CITIES

FACTORIES IN DETROIT . . . LOS ANGELES . . . HAMILTON, ONT.

always be sold to a prospective buyer.

70% of job stamping from firms with stamping divisions

Somewhat to our surprise, in a recent survey of our orders, we discovered that over 70% of our business was derived from firms with large stamping divisions. A cost-conscious stamping buyer and a progressive job stamper make a good team. Through team work, results may be derived that are to the mutual advantage of each.

QUALIFICATIONS OF A COST-REDUCTION ENGINEER

Cost reductions must be made from the drawing room to the shipping dock. Everyone along this path must make his contribution. In general, it is everybody's business.

In particular, however, it is the job of the cost-reduction engineer. This job calls for a composite expert. He must understand product engineering, cost estimating, industrial engineering, planning, tool engineering, cost accounting, and to some extent purchasing. He musts be an analytical, accurate and imaginative self-starter.

Men, materials and machines

He must visualize and accurately forecast results in advance of trial. He must decide the course of action from an analysis of the advantages and disadvantages of the various possibilities of accomplishing an end. He must base his decisions on every possible factor that may apply to the proper equation of men, materials and machines in the pricing formula.

The cost reduction engineer must be familiar with every class of material that may be used to advantage in a product. This includes consideration of availability, strength, appearance, utility, customer appeal and cost. He must thoroughly understand the comparative methods of fabrication of various materials and how it fits in the available equipment.

The importance of design

He must consider the designs that will best translate maximum strength to a product with the minimum cost of material in mind. He must see the possibilities of combining parts to bring out the cheapest end result without sacrificing any desirable features. He must eliminate every costly feature that may be accomplished more efficiently in some other way.

A cost-reduction engineer must enlist, in a diplomatic way, the cooperation of the various departments where possible savings may be effected. Perhaps there are many supervisors who have some improvements in mind, but have not had an oportunity to carry them out. Teamwork will hasten the solution, for each will be able to contribute experience that the others may lack.

A conscientious cost reduction man is in a position to make as great a contribution to his firm as any man on the payroll. The trend to increase values of all products is here to stay, and we must join in that effort or fall by the wayside. A cost reduction engineer can initiate changes of great value to the firm that employs his services.

may be realized by installing a low-cost Yoder Cold-Roll-Forming, Electric-Weld Tube Mill. Cold or hot rolled strip is fed continuously into the mill, coming out as finished pipe or tubing, automatically cut to length.

Yoder mills are notable for their low first cost, high speed, low labor and maintenance cost. They offer not only the highest production per dollar of investment, but for most requirements also the lowest conversion cost per ton, in making sizes from ¼" up to 30" diameter.

Through recent exclusive Yoder developments, higher production is now obtainable than ever before. For sizes up to 3" dia., speeds up to 250 fpm are obtainable with a Yoder-Tocco induction welder incorporated in a Yoder mill.

For making the largest sizes, when tonnage requirements are not too high, the initial investment may be greatly reduced with a Yoder Press-forming, Arc-weld mill.

Yoder offers you the widest choice of mills of proven performance. Over 150 Yoder Pipe and Tube Mills are now in successful operation all over the world.

Literature and further information on request

THE YODER COMPANY • 5559 Walworth Ave., Cleveland 2, Ohio

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

PMI Technical meeting

→ *from Page 36*

actual production processes and problems. I know of no better way to provide this than to put him to work in the plant. Let him participate in the actual practice of producing stampings. Put him in the tool room

. . . in the press shop . . . Let him join in the bustle of shop activity and thereby learn for himself the need for diligence and efficiency. . . . This close association with actual shop practice will accomplish the desired result in much less time than would be required by a more academic approach."

Even older salesmen with some mechanical ability, who possibly have had some practical experience in the selling of kindred products, should be provided with opportunities to get into the plant, said Wenning. "In our plant, we encourage frequent visits to the plant to supplement the annual sales conference."

In addition to developing a knowledge of a stamping product, the salesman must also be taught the need for obtaining an intimate knowledge of his prospective customer's requirements. With the knowledge gained in the shops, the salesman should be qualified to go into his customer's plant to observe applications for stampings and suggest methods of redesign and thus provide "that extra service about which we all talk so much," said Wenning.

QUALITY CONTROL

Moderator for the closing panel, on "Practical Quality Control for Stamping Plants," was Henry J. Jacobson, quality control director, Grand Sheet Metal Products Co., Chicago.

On the panel were Wade Weaver, director of quality control, Republic Steel Corp., Cleveland; and Lt. Col. G. H. Van Veen, Chief, Technical Methods Section, Quality Control Division, Wright-Patterson Air Force Base, Dayton, Ohio.

Inspection and production should be on equal footing

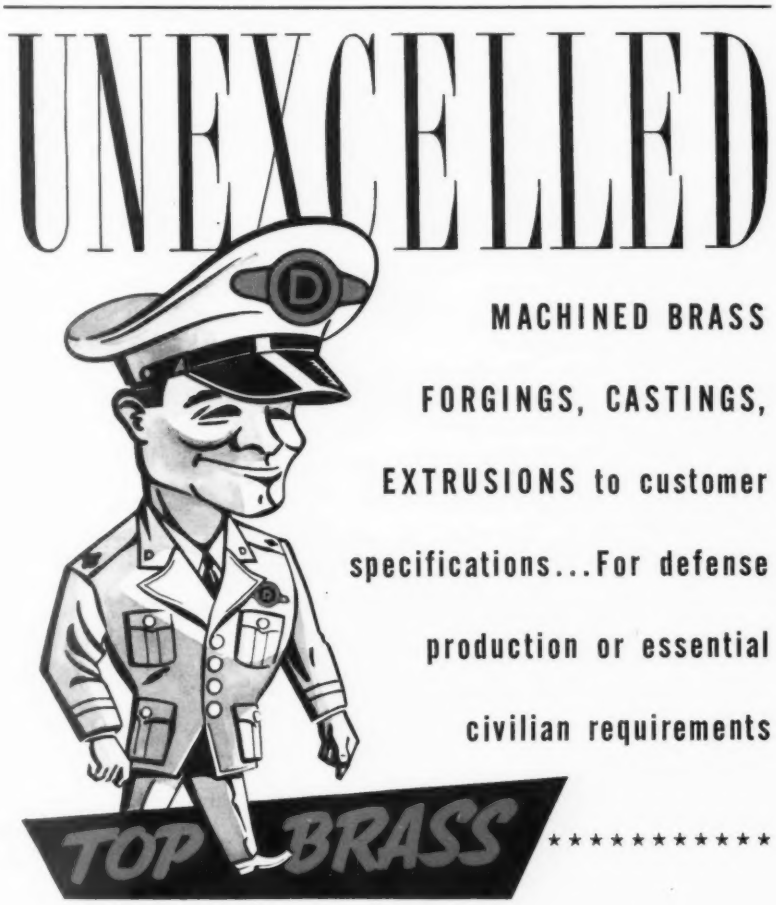
In establishing a quality control program, Jacobson pointed to the necessity of having the heads of both the inspection and production departments on the same level, and reporting to the same superior. He suggested a gradual tightening of inspection, rather than an abrupt demand, so as to create more of a willingness on the part of employees to go along with the new quality control program.

Some of the changes already brought about at Grand Sheet Metal Works, as a result of the introduction of a quality control, were listed by Jacobson as follows: cleaner departments, better lighting in the press room, in some cases, a revision of packing and shipping methods, increased tolerances and allowances on some products, which resulted in large savings in the cost of die repair and rework.

Quality control by statistical methods

"Quality control by statistical methods began to enter the picture only after our inspection program was well established," stated Jacobson.

"In connection with our monthly report, which showed the fraction defective of every part made during the month, we started fraction defective charts for all products. . . . Our monthly reports are quite detailed and show the number of parts in-


UNEXCELLED
MACHINED BRASS
FORGINGS, CASTINGS,
EXTRUSIONS to customer
specifications...For defense
production or essential
civilian requirements
TOP BRASS
Producers and Suppliers of materiel for: U. S. Army Ordnance • U. S. Navy • U. S. Army Air Corps • Maritime Commission and the following industries: Air Conditioning • Aircraft • Automotive • Beverage • Diesel Engine • Dry Cleaning • Farm Equipment • Gas Appliances • Locomotive • Oil Refining Equipment • Oil Heating Equipment • Plumbing • Refrigeration • Rubber • Spray Equipment • Washing Machine • and others.
DETROIT BRASS & MALLEABLE WORKS
SPECIALTIES DIVISION
DETROIT 9, MICHIGAN
AT YOUR SERVICE IN THE NATIONAL EMERGENCY

spected, fraction defective, and type of defects in each product. The first page of the report is a composite chart of the overall plant fraction defective, and the second sheet is a monthly summary and analysis of the report with recommendations for improvement. . . .

"In order to standardize our inspection procedures we began writing inspection procedures and process control procedures. These were placed in attractive binders, and given to all supervisors for reference. . . . Control charts are not too much in evidence as yet. . . .

"Quality control is now an integral part of our manufacture. Gradually, we are adding more and more controls and doing more research that is beginning to cut down on our costs, and has already made tremendous cutbacks in our rework," concluded Jacobson.

Reducing opinion to fact

Wade Weaver, who has had over 20 years of plant experience in the mills of Republic Steel, said that the greatest thing about quality control is that it reduces opinion to fact.

He even ventured the following theory on the subject: "Modern quality control is an objective, scientific approach, making use of the most modern technological tools to solve a problem."

A management tool

"Quality control is a management tool," said Weaver, "and it belongs at the top. It doesn't have to function at the top, but because top management decisions are required to straighten out the things which quality control helps to uncover, unless it reports to the top, it is doomed to failure, except in a very specific area."

The Air Force and quality control

Lt. Col. Van Veen stated that a quality control division is basically a quality evaluation organization.

"We have, for good reason, decided that Air Force quality evaluation will be based on evidence presented by the contractor. The Air Force verifies the contractor's reports by various methods, including physical inspection performed by the Air Force as a function of the effectiveness of the contractor's control over his quality.

"This quality evaluation policy, we believe, provides the Government with maximum quality protection at minimum cost, and at the same time it encourages contractors to apply up-to-date methods of quality evaluation and control. By basing our quality decisions on the total reservoir of available verified quality information, we are developing management techniques which will, we hope, have real value in industry, as well as serve the immediate interests of the Air Force."

EEI conference

→ *from Page 38*

fore the salesman even approached the prospect.

When all of the salesmen were busy, in only 45% of the cases studied did a salesman verbally acknowledge the presence of the prospect. In only 21% of the instances, after a so-called presentation, did a salesman take the prospect's name and address. And that's what happens

NEED BURNING TOOLS FOR DEFENSE PRODUCTION?
FAHRALLOY HAS THE ANSWER!
If you are converting for the mobilization program consult Fahralloy for your burning tool needs. We may have the exact patterns for your needs. If the job requires SPECIAL application FAHRALLOY engineers will quickly and inexpensively design it for you. Either way you'll be getting the finest burning tools possible; tools that mean higher thermal stress protection with correct chromium and nickel analysis . . . practically no weight loss, breakage or warpage . . . minimum bearing area and proper suspension whatever the parts to be enameled. Send today for FAHRALLOY Catalog 48 or write for direct consultation with FAHRALLOY engineers.
FAHRALLOY
Burning Tools for Porcelain Enameling
THE FAHRALLOY COMPANY
150th & Lexington, Harvey, Ill.
FAHRALLOY
RESISTS HEAT AND CORROSION!

ESTATE SPRING PROGRAM STRESSES DEALER AIDS

Estate dealers are being offered a wide selection of sales aids specially designed to tie-in with Estate Stove Company's national ad campaign. A full-color display kit and a life-size cutout of Duncan Hines help dealers make an effective presentation of the ad program's important features.

after money is spent to get the prospect to the store.

The *fifth* deals with demonstrations of appliances. Advertising should suggest that customers go to the utilities' or dealers' stores for demonstrations. And the salesmen should really demonstrate.

The *sixth* session is concerned with closing the sale—and that alone is worth the price of the entire course. The approach to this difficult subject is realistic. It does not gloss over the problem lightly. Clark & Associates' survey showed that only 44 out of 100 times did the salesman ask the customer to buy, meaning that the salesmen contacted during the study were only 44% efficient in the most important step of the sale.

This six-session training course can be used to help hire and train new salesmen.

The course can be used as a refresher to train experienced salesmen — maybe some of those rated as 13% effective by Clark & Associates. The prospecting, demonstrating and closing units can be used for single sales sessions.

The selling sequences from individual units can be used for specific product training.

The course can be used to help sell more appliances. It can be used to help sell more residential kwhrs.

Complete kit includes films

The complete course includes six recordings, six full-length films, six trailer films, six salesman's manuals, and six leader's guides.

The annual revenue from ten range sales will pay for it — or — the annual revenue from 10 dryer sales will pay for it — or — the annual revenue from six water heater sales will pay for it.

Tool engineers . . .

→ *from Page 44*

Dr. Lewis stated that standard gauge blocks which do for roughness what the Johanssen gauge blocks do for checking dimensions are now available, and can be used for calibrating of roughness checking instruments. The commercial blocks are made of pure nickel, plated with a thin protective coating of rhodium, a rare element of the platinum group which is unaffected by acids. The original master blocks were made of pure gold.

New sand casting process cuts production costs

A new sand casting process now in operation in 23 American foundries is cutting production costs by eliminating machining operations and reducing material losses usually incurred in conventional sand casting methods, stated Richard Herold, manager, foundry products department, chemical division, The Borden Company, New York City.

Sand castings produced with the "Croning process shell molds", as they are called, can be mass-produced to tolerances of from two to three thousandths of an inch per inch of length, compared to twice this amount for conventional sand casting, said Herold. *to Page 60* →

Use NAGEL-CHASE V-BELT PULLEYS *for PRODUCTION ECONOMIES* on AUTOMATIC WASHERS and DRYERS!

More and more manufacturers are standardizing on NAGEL-CHASE V-Belt Pulleys for their automatic washers and dryers.

Made from pressed steel and welded they have the strength and wearing qualities that provide long, trouble-free service. Belt wear is reduced to a minimum. With the Nagel-Chase construction the pulley cannot become loose from the hub.

Along with these advantages, Nagel-Chase pulleys frequently offer substantial savings in production costs.

Consult Nagel-Chase on your pulley requirements today!

THE NAGEL • CHASE MANUFACTURING COMPANY
2811 N. Ashland Avenue, Chicago 13, Ill.
SPECIALISTS IN CASTERS AND PULLEYS FOR NEARLY A QUARTER CENTURY!

ALSO MANUFACTURERS OF NAGEL-CHASE WASHING MACHINE CASTERS

REVCO JOINS NEMA

Revco, Inc., Deerfield, Michigan, has joined the National Electrical Manufacturers Association, and is affiliated with the Major Appliance Division, and the Farm and Home Freezer Section.

GIBSON TO MAKE ROOM COOLERS

Gibson Refrigerator Company, Greenville, Michigan, has announced its entry into the room air conditioning field. Production for this year will be concentrated on a ¾ hp window model, according to J. L. Johnson, vice president in charge of sales.

FIRST QUARTER GAS RANGE SHIPMENTS TOTAL 496,600

Shipments of domestic gas ranges totaled approximately 496,600 units during the first quarter of this year, according to Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association.

CENTRAL ENAMELERS, MAY 16

Central District Enamelers Club will meet Friday evening, May 16 Allerton Hotel, Cleveland, Ohio. B. J. Sweo, of Ferro Corp., will discuss direct application of one-coat white.

Tool engineers . . .

→ *from Page 59*

He revealed that the process is not confined to small parts. Castings weighing more than 200 pounds are being produced with the process. Aluminum, iron, bronze, alloy steels and stainless steels are all suited to shell molding, according to Herold, and development is progressing in applying the process to magnesium and low carbon steel.

Die steel hardness adjusted by heat treatment

If a metal forming die wears out, it's too soft; if it breaks, it's too hard, and in either case costs can be cut if the trouble is remedied, stated Dr. S. G. Fletcher, chief metallurgist, Latrobe Electric Steel Co., Latrobe, Pa.

Fletcher said that die steel hardness can be adjusted to best advantage by heat treatment. He explained that the ability to harden iron-base alloys, of which dies are made, depends on two different atomic arrangements present in iron: one at room temperature, and the other when it is above its critical temperature. Thus, by heating iron above its critical temperature and cooling it quickly to room temperature, the hard atomic structure formed at the high temperature is retained in the material. To attain the desired degree of hardness in metal forming dies, extremely close control of temperature during the heat treatment process is necessary.

Fletcher also pointed out that die wear is affected by the amount of carbon in the surface, and recommended that this factor be controlled by methods that prevent loss of carbon from the die surface during heat treatment.

USE PHOTOLAYS

to accent your new model design

Provide extra sales appeal at small cost

Sparkling with sales appeal, inexpensive photolays in glass by Corning dramatize nameplates, escutcheon plates, clock faces, dials . . . make any product feature stand out. You can use them for distinctive point of sale signs or purely for decoration . . . all at small cost.

For photolays require no costly tools or dies. Your name, trade-mark or any decorative design you may choose is photographically transposed into clear glass, giving it a beautiful three dimensional appearance. It can be worked out with a wide assortment of color backings with direct, indirect, or edge lighting.

HERE'S A WHOLE BOX FULL OF IDEAS

. . . The photolay demonstrator shows you all sorts of ways to use photolays to put *more sell* into your products. We shall be glad to demonstrate it to you at your convenience. Write or phone Appliance Parts Department.

PYREX

CORNING GLASS WORKS, CORNING, N. Y.

Corning means research in Glass

VISIT THE NEW CORNING GLASS CENTER

PYREX brand Oven Windows VYCOR brand Burner Plates Oven Lightingware
PYREX brand Plate Glass Range Top Lightingware Other Range Specialties

May · 1952
safe transit
FROM ASSEMBLY LINE TO FINAL CUSTOMER

Your Best Source for

WATKINS CONTAINERS

AND ALL YOUR CRATING AND MATERIAL HANDLING NEEDS IS

KIECKHEFER MILWAUKEE

Producers of . . .

CRATES
PALLETS
BOX SHOOKS
WOODEN BOXES
WATKINS CONTAINERS
KIECKHEFER PALETBOXES
INDUSTRIAL LUMBER
SPECIAL DESIGN CLEATED FIBRE CONTAINERS

Kieckhefer-Milwaukee knows how to *engineer* and how to *build* the kind of containers that will deliver your products safely into your customer's hands. There are 50 years of practical experience behind the products we build and sell.

We highly recommend the Watkins type container for many product applications. If your product is not suitable for this fine shipping method, we will recommend the box or crate that *is* suited to your needs.

Kieckhefer-Milwaukee has the plant facilities to meet your production requirements and we are proud of our reputation for meeting shipment schedules — we definitely meet all promised shipment dates.

Kieckhefer-Milwaukee Containers will meet your Government Specifications

PACKAGING ENGINEERS KIECKHEFER MILWAUKEE FOR FIFTY YEARS

KIECKHEFER BOX AND LUMBER CO.

• WOODEN BOXES • BOX SHOOKS • CRATES • CLEATED FIBRE SHIPPING CONTAINERS •

1715 WEST CANAL STREET, MILWAUKEE 3, WIS.

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and allied metal products field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

CONTENTS

MATERIALS HANDLING OPERATIONS FOR A. O. SMITH WATER HEATERS by Don Hartquist ST-5

PACKAGING EXPOSITION DRAWS RECORD ATTENDANCE ST-11

101 COMPANIES NOW COOPERATING IN SAFE TRANSIT PROGRAM ST-15

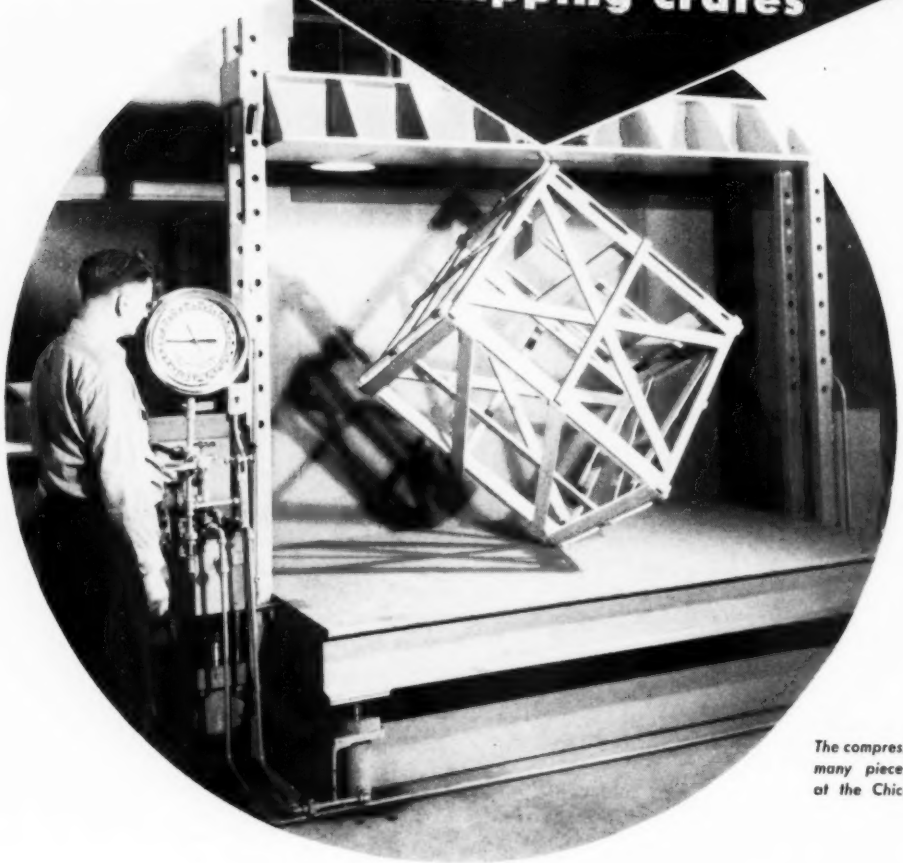
FEDDERS-QUIGAN, ALTORFER BROS., REMINGTON, McCRAY REFRIGERATOR CERTIFIED FOR SAFE TRANSIT ST-17

COPYRIGHT 1952
DANA CHASE PUBLICATIONS
PRINTED IN U.S.A.

Over 21,500 packaging men — *passed through the turnstiles at Atlantic City's Auditorium during the 21st National Packaging Exposition sponsored by the American Management Association.* *(See report of exposition starting on Page ST-11.)*

Portion of Frigidaire section — *of General Motors packaging display at Exposition. Sign on top of cutaway package at left reads "Unit Package — 77-Part Package for Modernizing One Refrigerator." Sign on top of package at left with cutaway corner reads "Automatic Washer Tub — Individual Pack."*

putting the pressure on shipping crates



The compression tester—one of the many pieces of test equipment at the Chicago Mill Laboratory.

The "Chicago Mill and Lumber Laboratory Tests" Pre-Prove Your Crates and Boxes

Wirebound,
Nailed or Hinge Corner
Cleated Plywood
Cleated Craveneer
Cleated Corrugated
Shop and Tote Boxes
Woodsteel Nesting Boxes

★

FOR DOMESTIC OR EXPORT
FOR PEACE OR DEFENSE

Chicago Mill crates or boxes are properly designed by competent engineers to deliver your product safely—and—they have been pre-proved in a completely equipped and staffed laboratory, a *National Safe Transit Certified Laboratory*.

Chicago Mill is the *only* single source for all the types of crates and boxes listed. Our engineers will recommend the type of crate or box best suited for *your product*.

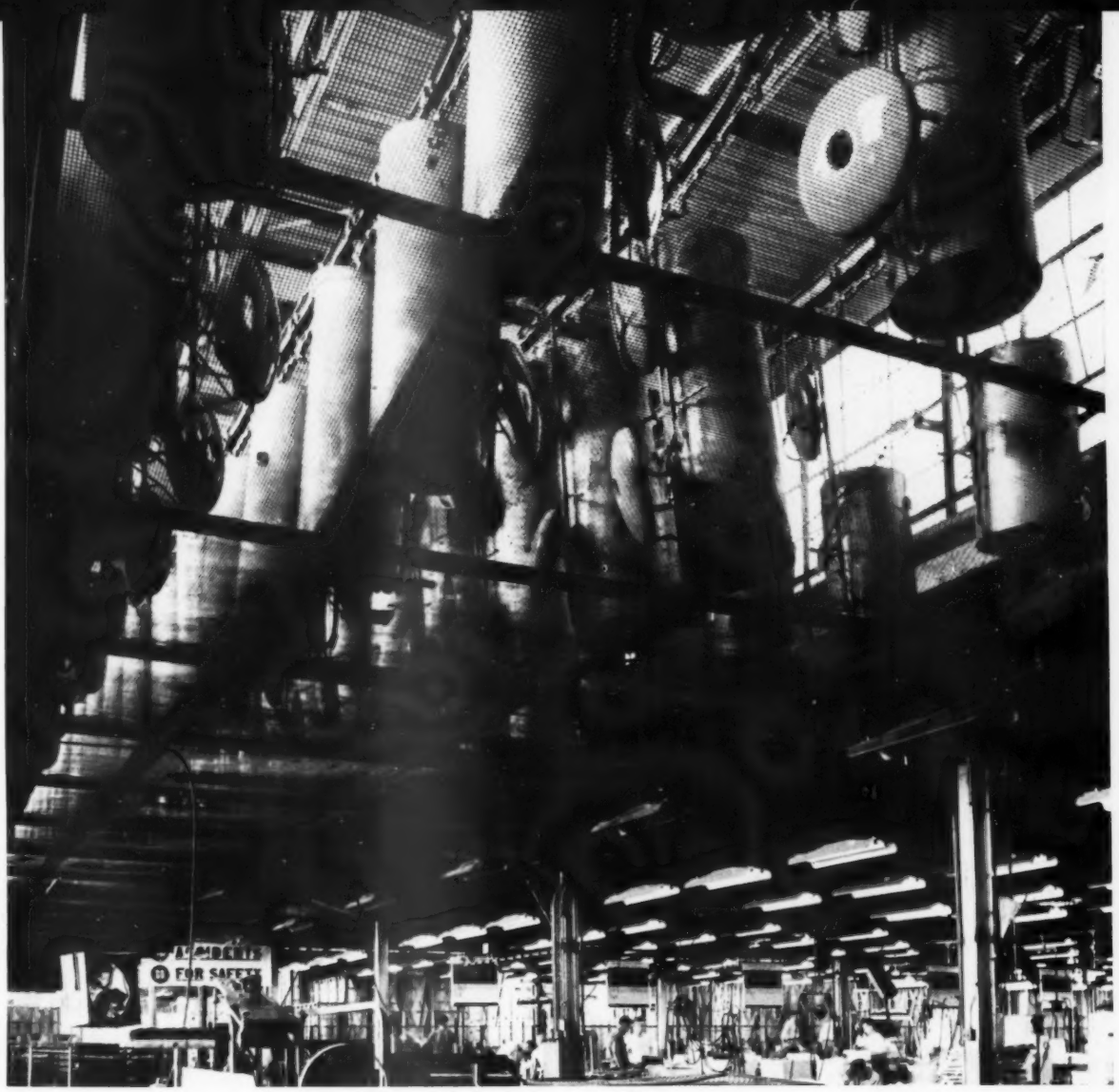
Technical service, packing information and the facilities of our fine laboratory are available without obligation to all Chicago Mill customers. Ask for information on this free, cooperative service.

FOR SAFER TRANSIT BY • TRUCK • BOAT • TRAIN • PLANE

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street **Chicago 3, Illinois**

Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois



Materials handling operations for A. O. Smith water heaters

by Don Hartquist • PLANT ENGINEER, A. O. SMITH CORPORATION, KANKAKEE, ILLINOIS

ALTHOUGH there are many plants or facilities today throughout the country which have been conceived, planned and engineered for the manufacturing of a specific product, A. O. Smith Corporation's water heater manufacturing plant, in Kankakee, Illinois, is one of the classic examples of this modern trend in industrial planning.

Every phase of the development of this facility was engineered to achieve the lowest manufacturing cost possible, to convert raw material into finished domestic water heaters.

Photo 1 — More than 1000 water heater assemblies can be stored on this overhead conveyor located in the high monitor of the building.

The flow of materials

Of course, there were many details involved in this planning which embraced various engineering fields, but we are primarily concerned here with the flow of materials through such a plant. Beginning at the receiving point, continuing progres-

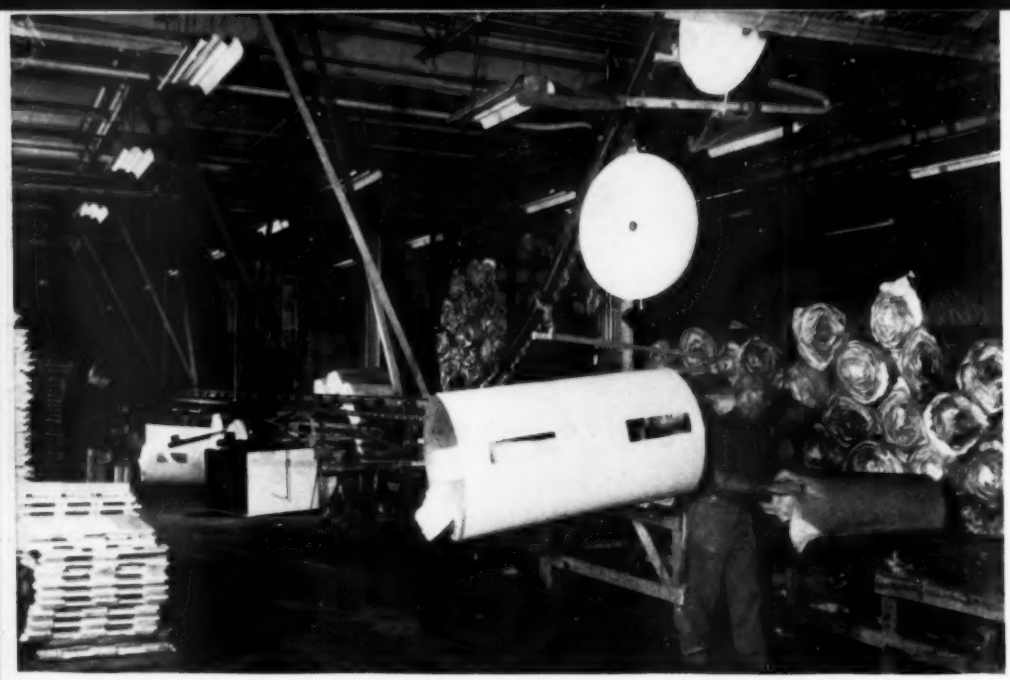


Photo 2—This overhead conveyor dips to working area to allow the loading of insulation and the shipping crate bases.

sively from storage to process, moving in the form of worked materials from department to department, from machine to machine, to sub-assembly, to final assembly, and packaging. Finally, the handling into storage or to railroad cars or trucks for shipment to customers.

To eliminate all possible bottlenecks and excessive handling costs, emphasis was placed on the standard, proven material handling methods during the planning stage. Most of these standard methods are employed in one form or another in the process. We make use of cranes and conveyors, lifts, hoists, monorail systems, chutes, tractors and trailers, trucks, skids, and pallets.

Use of standard conveyors

Some of the major material handling problems were solved using standard conveyors. These standard conveyors are interesting in showing how they were adapted for the particular handling job we have in manufacturing water heaters.

Generally, conveyors of all kinds are used for transferring parts from one location to the succeeding operation point. Not so frequently, they are used not only for transferring but for parts storage banks between operations as well.

Overhead storage for 1000 assemblies

A 458 overhead chain conveyor is used to transfer our inner tank assemblies from the glass-lining department to final assembly. Because three shifts are required to glass-coat these assemblies in the quantities assembled in one shift in final assembly, a bank between these departments is required. Slightly over 1000 assemblies are stored on this conveyor in the high monitor of the building (Photo 1).

Another overhead conveyor, not as heavy as the first, is a 348 chain conveyor. It is used strictly as a transfer from the white and black baked enameling department to final assembly. Ware is painted and hung in the sequence to be used in final assembly. In route the conveyor dips to allow

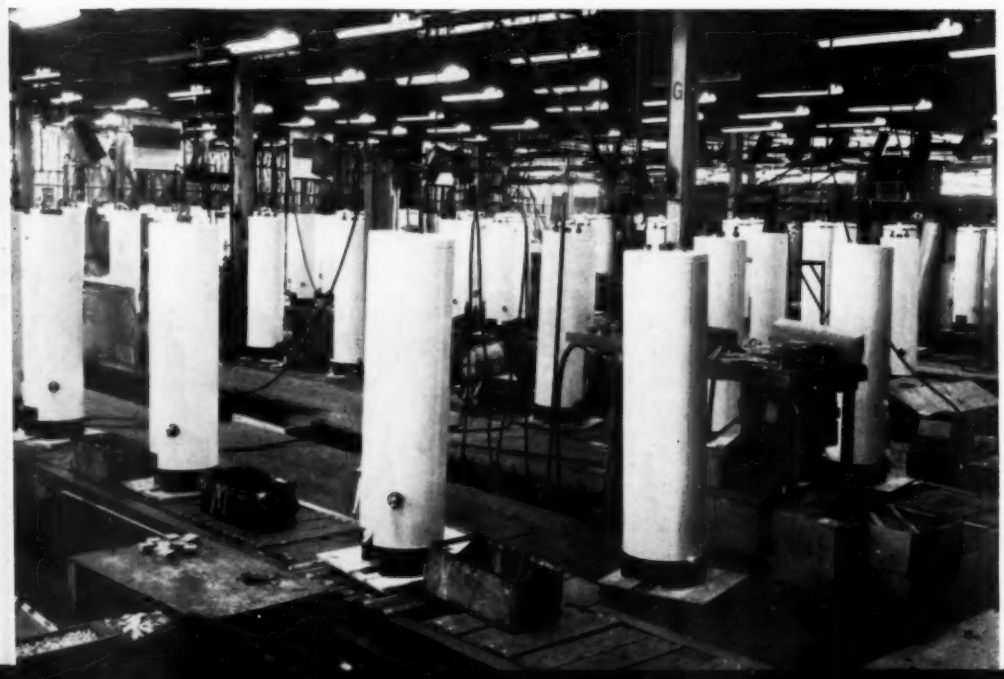


Photo 3 — Shown is a view across the final assembly lines. All parts of the heaters are scheduled to arrive here in proper sequence for final assembly.

Photo 4 — At termination of six final assembly lines, finished heaters are transferred to gravity roll-conveyors.

loading of insulation and crate bases (Photo 2).

Photo 3 shows a view across the end of the six final assembly lines. It is at this point that all parts of the heater are scheduled to arrive in a proper sequence for the final assembly operation.

Overhead is the painted parts conveyor. Sub-assemblies and purchased parts are delivered in sequence on a belt-conveyor. The inner tanks are supplied by the powered slat-conveyor. This method of scheduling in sequence is mostly widely used in the automotive industries.

Mechanical traffic controls at roll-conveyor intersections

At the termination of the six final assembly lines (Photo 4), the finished heaters are automatically transferred to six gravity roll-conveyors. All six of these conveyors deliver heaters to a cross-powered roll-conveyor. Mechanical traffic controls eliminate interference of the heaters at the intersections. Crating of the heaters is accomplished on one line which is a continuation of the powered roll-conveyor.

With all the consideration given in the planning stage to the best handling methods, after full production had started, some handling operations were obviously inefficient. They proved costly as well as bottlenecking. Each of these operations were singled out, studied, and solutions were reached for in completely new methods of handling for the particular job.

Handling the crated product

The most outstanding case of this kind developed in our storage and shipping of finished water heaters. Palletizing, transporting, and stacking with conventional fork trucks was the method planned, and at first seemed the best method. Actually we soon found that it bottlenecked the whole plant operation, once the other departments started to hit their pace.

Even with a young army of men and thousands of pallets, it was impossible to handle the heaters into

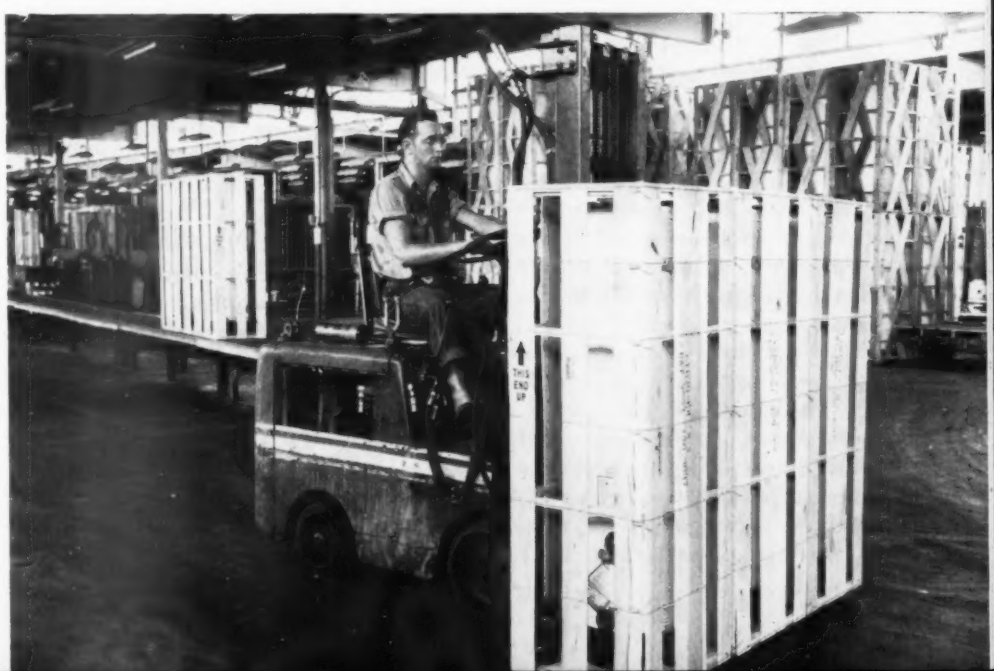


Photo 5 — Lift truck is used to transfer crated water heaters to storage or loading dock. A special finger lift attachment is utilized in this operation.

Photo 6 — Lift truck, with finger lift attachment, is used to load crated water heaters into boxcar. Note strapping to be used to secure load.

storage or into cars or trucks as fast as they were coming off the assembly lines. The floor space required to store any quantity was tremendous because of all the air space left between the heaters. Some models were of such a size that four could be placed on one pallet; however, with most of the models, especially the large models, one pallet would accommodate two and sometimes only one. At one time it required 170,000 sq. ft. of floor area to store 18,000 crated heaters.

"Finger lift" attachment for standard lift trucks

After many studies and investigations trying to find a better handling method, the solution to all of our problems in this department resulted from the design and installation of a unique attachment on our standard lift trucks (Photos 5 and 6). This attachment we call the "finger lift".

The design of the attachment embodies a series of short spring loaded fingers, mounted on a horizontal shaft, so that slight pressure on the tips of any of the fingers causes them to retract by tilting backwards. A vertical apron below this shaft serves as a backup or rest for the lower portion of the load. This assembly is mounted on the cross bars which carry the conventional forks on any standard fork truck.

Provisions were made for an eight-inch side shift travel of the whole assembly. This side shifting is accomplished with an additional hydraulic cylinder connected to the hydraulic pump on the fork truck.

In operation the truck moves forward until the apron meets the crate. In this position some of the fingers protrude between the vertical slats of the crate, while others are backed out of the way. The truck mast is raised and the fingers between the slats engage the horizontal cleat on the crate, or the crate top in some cases. The design of the fingers is such that the most forward end is rounded to slide up the slat when tilted out of the way. On either side of the individual fingers, standard saw blades, cut to size, are installed. The teeth of the blade extend approximately 3/16 of an inch above the top surface of the finger. These teeth bite into the wood cleat and provide the required resistance to the force tending to pull forward.

In the former method of handling crated water heaters from the storage stacks to the freight cars, two men in the storage area waited for a conventional fork truck with a pallet to come to the particular area to pick up the models for the shipment. They rode the pallet up to the second tier level and humped and jostled the crated heaters onto the pallet. The driver then delivered the pallet load to the freight car where two more men were stationed to man-handle the heaters into position in the box car. With this five-man crew, the best carloading time we could get was from 60 to 180 minutes, depending on the models being loaded.

Tiering three high was prohibitive because of the danger to the men required on top of the stacks, 10 to 12 feet in the air.

The trucks could only travel at a low speed, without dumping the top-heavy heaters. Even with caution, a day never passed that several loads or portions of loads weren't lost. Repairing costs to heaters damaged in this manner as well as the damage caused by the humping and scraping to position heaters in storage and in shipping kept a repair force of nine men busy.

The old method of handling from the assembly lines into storage required two of these five-man crews.

Now one truck driver, with no helpers, can handle the same number of heaters in 7½ hours that the five-man crew had difficulty handling in 10 to 12 hours. Pallets were eliminated and damages to the product became negligible.

Five 1500-lb. capacity trucks equipped with finger lift attachments with five truck operators have replaced the twenty drivers and helpers previously required. The repair force was reduced from nine to two. Total reduction in force was 22 men. Direct labor savings amounted to over $100,000 a year.

The constant confusion and the resulting shipping errors, high labor costs, excessive maintenance of equipment, damage to the heaters all dissolved into an orderly operation.

ADS OUT

Packaging exposition held in Atlantic City

including a report of a joint conference and display put on by twenty-four manufacturing divisions of General Motors

A THOUSAND and one different and better ways to protect products were exhibited at the American Management Association's 21st National Packaging Exposition held at Convention Hall, Atlantic City, April 1-4.

Altogether, more than 21,800 representatives of companies in every type of industry viewed the latest developments in packaging materials, methods, machinery, equipment and services.

Lawrence A. Appley, AMA president, described the show as "the largest, most inclusive and most successful in the entire twenty-one year history of the annual event."

Floyd L. Triggs, advertising manager, Riegel Paper Corp., New York City, and new chairman of the Packaging Exhibitors Advisory Committee for 1952-53, noted that this year's attendance was 5000 higher than at last year's show, and more than 2000 greater than the previous all-time high recorded at the 1950 show in Chicago.

On the basis of attendance and business done at the exposition, a record year for all phases of the packaging industry was forecast by officials of many of the leading exhibitors.

Packaging materials outlook

The supply outlook for packaging materials was seen as favorable in almost every case, with manufacturers and designers convinced that the days of shortages and substitutes are just about over. No substantial delays in deliveries of materials or machinery were contemplated by most companies.

To prevent damage to packaged products on their way from the factory to the consumer, exhibitors not only showed new and better cartoons and boxes, but also a lot of special packages and special cushioning materials.

Concurrent with the Exposition were conferences on packaging and handling of all types of products.

General Motors display

Twenty-four manufacturing divisions of General Motors Corporation in a joint display revealed how GM spent $42,000,000 last year for packaging to protect its products. (A photo of the Frigidaire section of the exhibit is shown on Page ST-3.)

Many of the packaging examples reflect maximum protection with minimum expenditure of material. For example, Hyatt Bearings Division showed a package of 3200 pounds of roller bearings securely contained in only 51 pounds of corrugated board, and mounted on a pallet of the same material. Similarly, Moraine Products Division packed 19,968 connecting rod bearings weighing 2100 pounds in corrugated board on a

Above: An over-all view of National Packaging Exposition. This year, the show was held on two levels of Convention Hall where 325 exhibitors utilized 105,000 square feet for the display of packaging materials, equipment, machinery, design and service.

non-returnable wood pallet, package weight being only 80 pounds.

Re-usable steel container for shipping jet engines

One of the most elaborate packaging examples was a re-usable steel container for shipping and storing jet aircraft engines, shown by the Allison Division. The container was air and water-tight, and, packed with 12 pounds of a dehydrating agent and 5½ to 8 pounds dry air pressure, is said to protect a jet engine from rust indefinitely.

Another example of military packaging was by Inland Manufacturing Division, which palletized five sections of tank track for compact stacking.

Pontiac's under-seat heater blower, with its many parts, represented compaction at its best. Harrison Radiator also achieved maximum compaction of its radiators and car heaters in corrugated board.

Frigidaire, largest package consuming division of GM, depended mainly on cleated plywood to protect its refrigerators, and on corrugated board for other appliances. It also made much use of a tape with 880 pounds tensile strength per inch of width. (For a photo story of materials handling operations at Frigidaire, see "*Frigidaire Uses Tunnel Conveyor System for Handling Finished Products*," Page 72, August 1951 *finish*.)

A pad wrap for car panels

Chevrolet showed tremendous savings in time, labor and shipping costs in the packaging of large sheet metal parts and replacement engines. Chevrolet was one of the first firms to use an excelsior pad wrap for body quarter panels, turret tops, doors and fenders for service use.

The replacement engine shown by Chevrolet was on a pallet base with saddle, with a wirebound wrap-around mat, with a hold-down piece which braces the engine in all directions. Attaching installation parts were enclosed in a carton.

A case study of the GM packaging program

An entire afternoon was devoted to a conference session on "The General Motors Packaging Program—A Case Study."

M. E. St. Aubin, director of service section, presented the introductory remarks. He stated that General Motors plants received 42,600,000,000 pounds of material a year.

"Throughout the manufacturing and packaging process this material was handled 30 to 50 times before it was shipped. Our labor costs for materials handling is equivalent to 13 per cent of the total net productive labor. In 1951, we used $42,000,000 worth of packaging materials."

Company-wide technical committees

Ralph A. O'Reilly, Jr., packaging engineer, GM service section, stated that the company relies on three company-wide technical committees, operating under completely decentralized control, to provide an effective interchange of ideas and know-how in this field. These committees are preservation-packing, service parts

Cleated Fibre Shipping Containers
for Refrigerators, Ranges, Washers, Furnaces and other appliances
Major appliances are handled and shipped with greater safety when packaged in cleated fibre containers.
Cornell Cleated Fibre Containers are dirt-proof, light in weight, strong, and can be printed to dramatically display and advertise your product.
Cornell Cleated Fibre Containers fully meet government specifications JAN-P-103 and NN-B-591a.
FOR boxes ...IT'S
CORNELL
PAPERBOARD PRODUCTS CO.
MILWAUKEE 1, WISCONSIN
SPECIALTY PAPERBOARDS • FOLDING CARTONS
CORRUGATED BOXES • SOLID FIBRE BOXES
CLEATED FIBRE CASES • FIBRE WALL BOARDS

packaging, and materials handling.

He cited examples of better manpower utilization through better packaging methods. He said GM depends heavily on its packaging suppliers for ideas on more efficient material utilization.

Pallet pack for radios

"The adoption of expandable pallet loads has been our greatest step forward in package convenience. Both for production and service parts, the savings in handling cost have been very impressive. A typical case is a Delco radio bound from the radio plant in Kokomo to Oldsmobile in Lansing. Once packed in individual cartons, these are now shipped 96 in a corrugated pallet pack saving 95 handling every time this material is moved. Delco Radio saves much packaging material, and 13% on cube, while Oldsmobile has correspondingly less unpacking time and no bother with returnable dunnage."

"The ratio between tare weight and net weight is the yardstick of our progress in weight reduction. The packaging methods of 20 years ago, if used on our present volume of materials, would raise our freight bill by many millions of dollars," concluded O'Reilly.

Unitizing of materials for mass production handling

Ray Chalmers, senior Chevrolet materials handling engineer, discussed "Unitizing of Materials for Mass Production Handling."

Chalmers said that the concept of efficient materials handling should begin with the manner in which raw materials are brought into plants, and should end only after finished products are on their way to customers.

Handling containers in place of materials

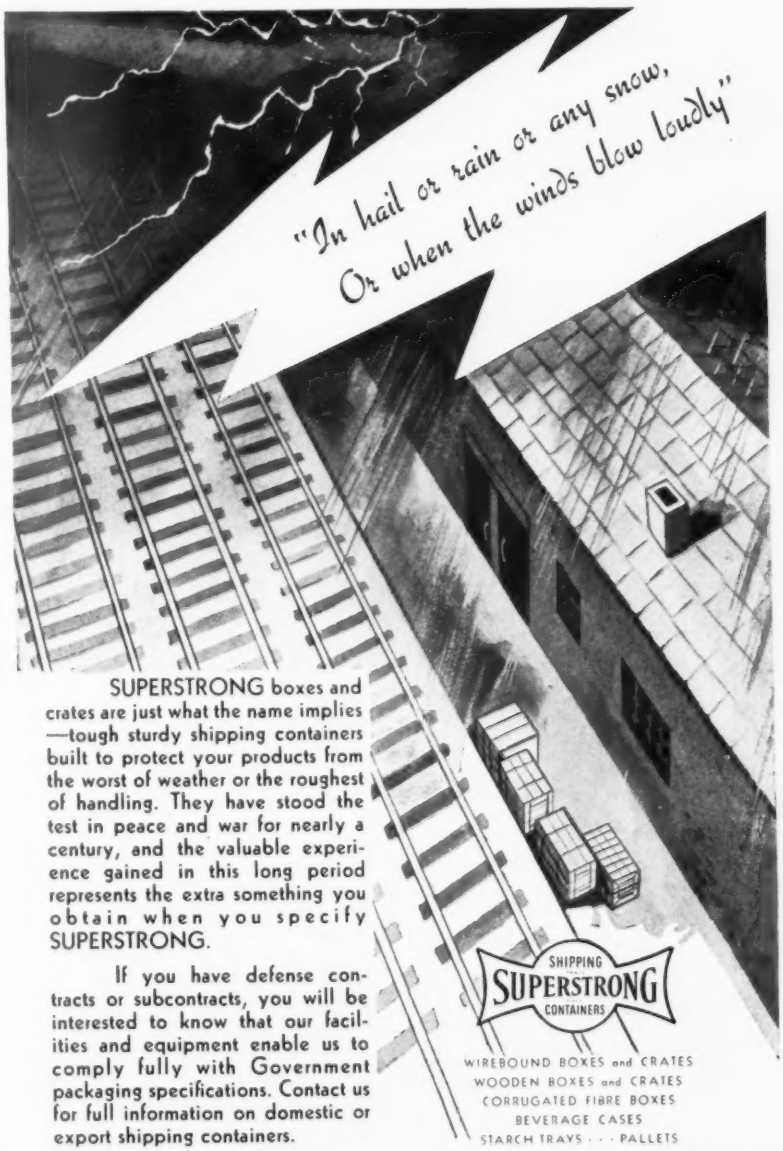
"The unitization of incoming and outgoing materials is revolutionizing the method of handling. In general, we now handle containers in place of materials. The unit load is basic, the container incidental. Regardless of the type of container used, the important factor is the method of loading that container. Greater economy is obtained through the use of the unit load as more material can be moved at a single time," stated Chalmers.

Safe Transit slogan cited

Chalmers cited the slogan of the National Safe Transit Committee: "*All manufacturing, engineering and quality efforts are in vain if the product reaches its destination in a damaged condition.*"

"This slogan," said Chalmers, "is accepted verbatim as the ideal. However, if we consider economic and transportation realities, we must be prepared to accept a certain percentage of failures, within commercial reason, or in military terms, *calculated risks.*"

Chalmers concluded that materials handling men are too few in number. "It's difficult to find qualified materials handling people. Therefore, train your people accordingly, and make their jobs attractive."



SUPERSTRONG boxes and crates are just what the name implies —tough sturdy shipping containers built to protect your products from the worst of weather or the roughest of handling. They have stood the test in peace and war for nearly a century, and the valuable experience gained in this long period represents the extra something you obtain when you specify SUPERSTRONG.

If you have defense contracts or subcontracts, you will be interested to know that our facilities and equipment enable us to comply fully with Government packaging specifications. Contact us for full information on domestic or export shipping containers.

RATHBORNE, HAIR AND RIDGWAY BOX CO.
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS
EASTERN SALES OFFICE • 121 NO. BROAD STREET, PHILADELPHIA 7, PA.

ST-13

WATKINS

cleated corrugated containers

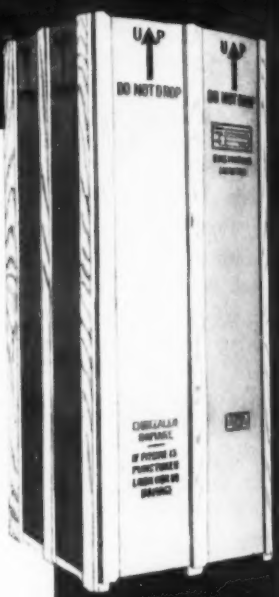
For Better • Safer • Shipping

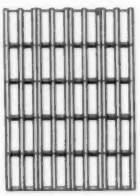
When choosing your product shipping containers, think of the scientifically-designed Watkins Containers which provide *complete* protection.

Your product will arrive at its destination SAFE and CLEAN, and the smooth, staple-free interior protects fine product finishes.

The 75% assembled containers reduce assembly time to a minimum, saving valuable man-hours.

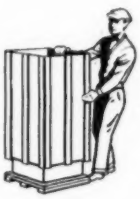
The "Traveling Billboard" feature of Watkins Containers is an extra feature. Your advertising message can be printed in two colors on all sides. Ship and Advertise the "Watkins Way."

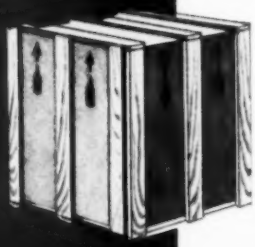


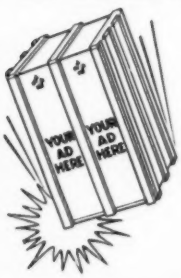


STACKING Vertical wood cleats provide EXCEPTIONAL SUPPORTING STRENGTH to carry heavy loads. Typical crate supports 4 tons.

QUICK Assembly line packing is speeded up. EASY TO HANDLE. *Complete* protection for your product.

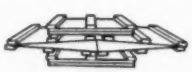






STRONG All wood cleats securely glued to tube-mat. Laboratory tests prove glued cleats RESIST WEAVE AND DISTORTION BETTER.

STORING Containers are delivered flat (only 3 sections) and closely nested to CONSERVE STORAGE SPACE.



THERE IS A
WATKINS CONTAINER
MADE NEAR YOU

These companies build WATKINS containers

CORNELL PAPERBOARD PRODUCTS CO.	1514 E. Thomas Ave., Milwaukee, Wis.
COZIER CONTAINER CORP.	446 East 131st Street, Cleveland, Ohio
CRATE-RITE MFG. CORP., Division of Pacific Ports Ind. Inc.	10901 Russet Street, Oakland, California
DURA-CRATES, INC.	940 East Michigan Street, Indianapolis, Indiana
GENERAL BOX CO., 1825 Miner St., Des Plaines, Illinois, and 16th and Maple Sts., Louisville, Kentucky	
HEMB & MARTIN MFG. CO.	Watseka, Illinois
ILLINOIS BOX & CRATE CO.	811 Center Street, Plainfield, Illinois
KIECKHEFER BOX & LUMBER CO.	1715 West Canal Street, Milwaukee, Wisconsin
LANE CONTAINER CORP.	10212 Denton Road, Dallas, Texas
LEWISBURG CONTAINER CO.	243 Singer Street, Lewisburg, Ohio
LOVE MFG., INC.	608 South Commerce Street, Wichita, Kansas

—an inquiry to any of these companies will get prompt attention—

The • WATKINS CONTAINER • Manufacturers

101 Safe Transit Certifications

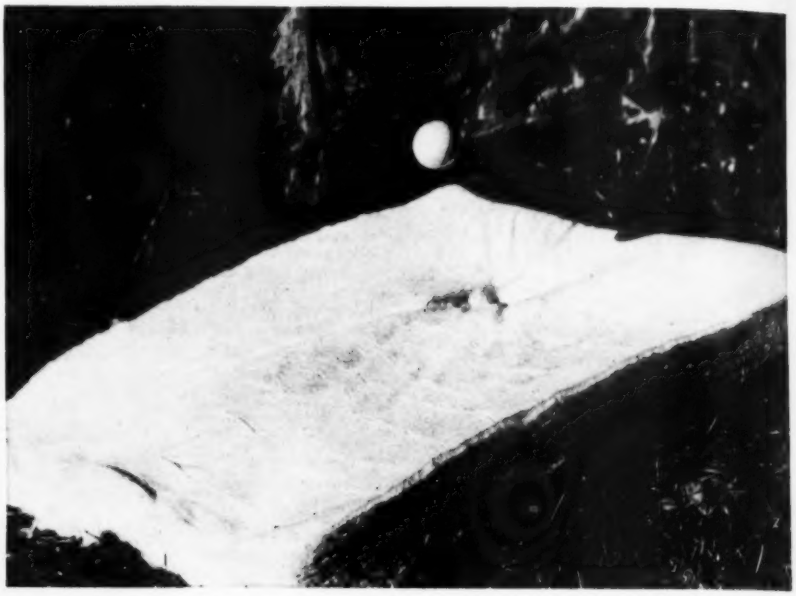
THE following companies are certified under the National Safe Transit Program.

Active Tool & Manufacturing Co.
Detroit, Michigan
Admiral Corporation
Chicago, Illinois
AllianceWare, Inc.
Alliance, Ohio
Altorfer Bros. Company
Peoria, Illinois
American Kitchens Division
Avco Mfg. Corp.
Connersville, Indiana
Andes Range & Furnace Corporation
Geneva, New York
Apex Electrical Manufacturing Co.
Cleveland, Ohio
Appliance Manufacturing Company
Alliance, Ohio
Automatic Washer Company
Newton, Iowa
Beam Manufacturing Company
Division of Solar Corporation
Webster City, Iowa
The Bellaire Enamel Company
Bellaire, Ohio
Belmont Stamping & Enameling Co.
New Philadelphia, Ohio
Bendix Home Appliances
Division — Avco Mfg. Corp.
South Bend, Indiana
Boston Stove Foundry Company
Reading, Massachusetts
Bryant Heater Division
Affiliated Gas Equipment, Inc.
Cleveland, Ohio
Caloric Stove Corporation
Topton, Pennsylvania
Canadian General Electric Co., Ltd.
Montreal, Quebec, Canada
Canton Stamping & Enameling Co.
Canton, Ohio
Central Rubber & Steel Corporation
Findlay, Ohio
Chambers Corporation
Shelbyville, Indiana
Chicago Vitreous Enamel Product Co.
Cicero, Illinois
Conlon Bros. Mfg. Co.
Chicago, Illinois
Conlon-Moore Corporation
Chicago, Illinois
Continental Water Heater Co.
Los Angeles, Calif.
Cribben and Sexton Company
Chicago, Illinois
Crosley Division, Avco Mfg. Corp.
Richmond, Indiana
Crosley Division, Avco Mfg. Corp.
Nashville, Tennessee
Crunden Martin Manufacturing Co.
St. Louis, Missouri
Day & Night Division
Affiliated Gas Equipment, Inc.
Monrovia, California
Dearborn Stove Company
Chicago, Illinois
Deepfreeze Appliance Division
Motor Products Corporation
North Chicago, Illinois
The Dexter Company
Fairfield, Iowa
Dixie Foundry Company, Inc.
Cleveland, Tennessee
Duo-Therm Division
Motor Wheel Corporation
Lansing, Michigan
Eagle Foundry Company
Belleville, Illinois
The Enamel Products Company
Cleveland, Ohio
Fedders-Quigan Corporation
Buffalo, New York
Federal Enameling & Stamping Co.
Pittsburgh, Pennsylvania
The Fletcher Enamel Company
Dunbar, West Virginia
Florence Stove Company
Kankakee, Illinois
Florence Stove Company
Lewisburg, Tennessee.
The Floyd-Wells Company
Royersford, Pennsylvania
Frigidaire Division
General Motors Corporation
Dayton, Ohio
General Electric Company
Erie, Pennsylvania
Globe American Corporation
Kokomo, Indiana
Hardwick Stove Company
Cleveland, Tennessee
Heintz Manufacturing Company
Philadelphia, Pennsylvania
Holland-Rieger Division
Apex Electrical Mfg. Co.
Sandusky, Ohio
Hotpoint, Inc.
Chicago, Illinois
Ingram-Richardson, Inc.
Frankfort, Indiana
International Harvester Company
Evansville, Indiana
Kaiser Metal Products, Inc.
Bristol, Pennsylvania
Kresky Manufacturing Co., Inc.
Petaluma, California
Kuehne Manufacturing Co.
Mattoon, Illinois
Landers, Frary & Clark
New Britain, Connecticut
A. J. Lindemann & Hoverson Co.
Milwaukee, Wisconsin
Lisk-Savory Corporation
Buffalo, New York
Magic Chef, Inc.
Cleveland, Ohio
Magic Chef, Inc.
Lorain, Ohio
Magic Chef, Inc.
St. Louis, Missouri
Majestic Manufacturing Co.
St. Louis, Missouri
Malleable Iron Range Company
Beaver Dam, Wisconsin
The Maytag Company
Newton, Iowa
McCray Refrigerator Company, Inc.
Kendallville, Indiana
Meadows Division, Thor Corporation
Bloomington, Illinois
Midwest Manufacturing Company
Division of Admiral Corp.
Galesburg, Illinois
Moffats, Limited
Weston, Ontario, Canada
The Moore Enameling & Mfg. Co.
West Lafayette, Ohio
Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Illinois
Murray Corporation of America
Scranton, Pennsylvania
Murray Manufacturing Company
Murray, Kentucky
Nash-Kelvinator Corporation
Grand Rapids, Michigan
Nesco, Inc.
Milwaukee, Wisconsin
Newark Stove Company
Newark, Ohio
Norge Division. Borg-Warner Corp.
Effingham, Illinois
Norge Division, Borg-Warner Corp.
Herrin, Illinois
Norge Division, Borg-Warner Corp.
Muskegon Heights, Michigan
Odin Stove Manufacturing Co.
Erie, Pennsylvania
O'Keefe & Merritt Company
Los Angeles, California
Payne Furnace Division
Affiliated Gas Equipment, Inc.
Monrovia, California
Perfection Stove Company
Cleveland, Ohio
Philco Corp., Refrigerator Division
Philadelphia, Pennsylvania
Prentiss-Wabers Products Co.
Wisconsin Rapids, Wisconsin
Ranney Refrigerator Company
Greenville, Michigan
Remington Corporation
Auburn, New York
Republic Stamping & Enameling Co.
Canton, Ohio
Geo. D. Roper Corporation
Rockford, Illinois
Milton Roy Company
Philadelphia, Pennsylvania
Seeger Refrigerator Co.
Evansville, Indiana
Seeger Refrigerator Co.
St. Paul, Minnesota
Servel, Inc.
Evansville, Indiana
A. O. Smith Corporation
Kankakee, Illinois
Speed Queen Corp., Ironer Division
Algonquin, Illinois
The Tappan Stove Company
Mansfield, Ohio
Temco, Inc.
Nashville, Tennessee
Thor Corporation
Chicago, Illinois
United States Stamping Company
Moundsville, West Virginia
Westinghouse Electric Corporation
East Springfield, Mass.
Westinghouse Electric Corporation
Mansfield, Ohio
S. S. White Dental Mfg. Co.
Staten Island, New York
York Corporation
York, Pennsylvania

18 SAFE TRANSIT LABORATORIES

American Gas Associations Labs.
Los Angeles, California
Atlas Plywood Corporation
Lawrence, Massachusetts
Chicago Mill and Lumber Company
Chicago, Illinois
Container Laboratories, Inc. (2)
Chicago and New York City
Cozier Container Corporation
Cleveland, Ohio
Dura-Crates, Inc.
Indianapolis, Indiana
The Fairfield Paper & Container Co.
Baltimore, Ohio (project 1-a only)
General Box Company
Des Plaines, Illinois
The Hinde & Dauch Paper Company
Sandusky, Ohio
Inland Container Corporation
Indianapolis, Indiana
International Paper Company
Georgetown, South Carolina
Ohio Boxboard Company
Rittman, Ohio
Package Research Laboratory
Rockaway, New Jersey
Packaging Service Corporation
Wyncote, Pennsylvania
The Don L. Quinn Company
Chicago, Illinois
Rathborne, Hair and Ridgway Box Co.
Chicago, Illinois
U. S. Testing Company, Inc.
Hoboken, New Jersey

Ever See a Raw Egg Drop 25 Feet and *BOUNCE*?



(left) THERE GOES THE RAW EGG—from a roof-top 25 feet above the ground. (above) EGG BOUNCES! Photo taken split second after raw egg landed on 2-inch thickness of CELLULINER.

New cushioning material provides 4 times the packaging protection of Creped Wadding

When the Army, Navy and Air Force went hunting for a better protective packaging material last Spring, they found it in CELLULINER, a new product developed after many years of research by The Gilman Brothers Company of Gilman, Connecticut.

Test after test showed that CELLULINER had a compressive resilience of 71.4%. Creped wadding, the material commonly used for interior packaging, tests at only 17.8%. Special Gilman processes can also make CELLULINER mildew-proof and flame-proof. Today, millions of feet of CELLULINER are being used by the Armed Forces.

CELLULINER comes in two basic types: the *absorbent* type takes up over 16 times its weight in water; the *non-absorbent* type takes up under 2.4 times its weight and actually floats indefinitely. Both are soft, clean, flexible, chemically neutral (average H-ion concentration 6.8).

Finally, CELLULINER *insulates*—it's the most efficient barrier to heat and cold ever offered in a commercial interior packaging material.

• **Costs are in line.** Despite its 300% greater protective capacity, which cuts packing and shipping costs and losses from breakage or damage in transit, CELLULINER costs about the same per square foot as creped wadding. Users get 4 times the protection per packaging dollar or need to use far less material.

(right) President Lawrence M. Gilman of The Gilman Brothers Co. holds 1-inch thickness of flame-proofed CELLULINER against acetylene flame hot enough to melt steel. Only outer layer chars — his bare hand is safe against 2000° flame!

CELLULINER
REG. U.S. PAT. OFF.

the amazing new cushioning material

SAVES YOU MONEY

...on every package!

...on every shipment!

Whatever your packaging problem—flotation, blocking and bracing, or surface protection, CELLULINER's 300% greater compressive resilience saves you money. You get 4 times the protection of creped wadding! You cut breakage and damage losses, or, since CELLULINER's cost is about the same as creped wadding, you save by safely using far less! And CELLULINER's resilience lasts! CELLULINER stands up under heavy loads and repeated shocks—never develops "permanent set." That's why Army, Navy and Air Force are using millions of feet—why scores of major U.S. firms specify CELLULINER for all their plants!

CELLULINER FACTS

Comes in rolls or sheets 4" to 80" wide, .125" to 2.0" thick—or can be die-cut to any special shape at factory. Faced and backed with tissue, creped Kraft, rust-resistant or anti-tarnish paper, corrugated board, muslin or plastic to meet specific needs in either absorbent or non-absorbent types. Meets or exceeds Fed.Spec.UU-C-843. Can be flame-proofed to withstand acetylene torch temperatures above 2000° F. and/or mildew-proofed to meet or exceed Mil. Spec. MIL-F-5030. Chemically neutral, won't tarnish, corrode or chemically alter any material or product. Light, clean, soft, flexible, strong.

WHAT CELLULINER IS

A precisely manufactured cushioning material, made by special Gilman processes, from cotton, nature's own tubular form of cellulose. CELLULINER'S very high compressive resilience comes in part from this tubular structure—for the hollow tube is the lightest, strongest, most resilient structural form. Cotton's high insulating capacity helps to make CELLULINER the most efficient barrier to heat and cold commercially available in an interior packaging material. Made only by

The Gilman Brothers Company
GILMAN, CONNECTICUT • Est. 1897

The Gilman Brothers Company, Gilman 5, Conn.
Please give me more information about CELLULINER.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

NAT'L SAFE TRANSIT PROGRAM CERTIFICATIONS REACH 101

McCray Refrigerator, Fedders-Quigan, Altorfer Bros., and Remington are added Safe Transit certifications

The National Safe Transit Committee has announced that company certifications under the NST program now total 101.

The latest company certifications include: McCray Refrigerator Company, Inc., Kendallville, Indiana; Fedders-Quigan Corporation, Buffalo, New York; Altorfer Bros. Company, Peoria, Illinois; and Remington Corporation, Auburn, New York.

The distinction of being the 100th certified company goes to Altorfer Bros., manufacturers of washing machines.

Manufacturers of home appliance and allied metal products, who are interested in receiving complete details of this voluntary program for the reduction of packaging and shipping losses on their packaged products, are urged to contact the National Safe Transit Committee, 1010 Vermont Avenue, N. W., Washington 5, D. C.

PLAN MATERIAL MANAGEMENT CENTER AT WAYNE U.

Plans for a material management center at Wayne University, Detroit, were revealed at a recent luncheon meeting of industry leaders in the Detroit area.

Dr. Spencer A. Larsen, director of the center, pointed out that railroad freight damage claims total about $100,000,000 a year, and have run as high as $135,000,000 annually. This great waste, he said, could be materially reduced by proper packaging and materials handling.

He urged that industry and education cooperate to whip the problem of waste in material handling. He said that an industry advisory committee will be sought to work with Wayne University. The school's studies of the problem were said to date back to 1944.

Larsen stated that six professional and civic organizations are working with Wayne University to raise funds needed to acquire facilities for the center. Cooperating groups include: the American Material Handling Society, American Society of Mechanical Engineers, Society of Industrial Packaging and Materials Handling Engineers, Material Handling Institute, Michigan Training Council, and the Detroit Board of Commerce.

Chairman of the center's finance committee is Don W. Kelsey, who stated that sizeable contributions already have been received from Union Steel Products Company and Ford Motor Company.

The center will train employees of industrial firms in such varied facets of material handling as: procurement, packaging and preservation, layout and equipment development, handling, inventory control, standards, quality control and grading, warehousing and storage, loading and traffic.

BETTER SHIPPING, HANDLING EXPOSITION IN SYRACUSE

The Traffic Club of Syracuse, N. Y., has scheduled a "Better Shipping and Handling Exposition" for Monday evening, May 19. The activity of the National Safe Transit Committee will be discussed at the show by James Muirhead, of Easy Washing Machine Corp.

INDUSTRY SHOULD TRAIN PACKAGING ENGINEERS

At a recent meeting of the Philadelphia section of the Society of Industrial Packaging and Materials Handling Engineers, Dean H. C. Roundtree, of Temple University's Community College, stated that the true responsibility for training packaging engineers lies with industry.

Dean Roundtree said that the individual can enroll in particular courses which will help him become a packaging and materials handling engineer, but the over-all training must be received in industry. It was pointed out that an over-all curriculum is a current project of the national SIPMHE organization.

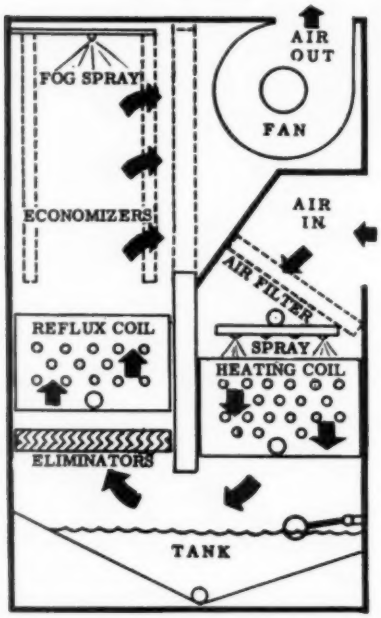
New Supplies and Equipment

E-11. Aluminum sheet "cleanliness" tester

A troublesome factor in the welding of aluminum sheet is the so-called "cleanliness" of sheets as presented to the welding head. The surface electrical resistance, in microhms, is a measure of the effectiveness of the oxide removal or cleaning process employed.

A new portable model Microhm Meter is said to readily measure the total surface resistance of two sheets, or coupons, when placed between two dummy electrodes. It can accurately measure a resistance as low as .000001 ohm, with the readings practically instantaneous.

E-12. Controlled humidity method of air conditioning

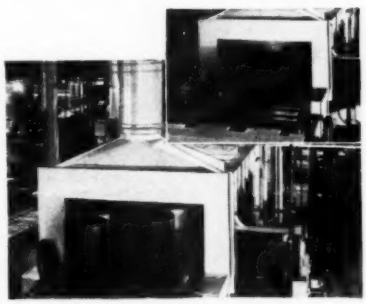


An improved model concentrator for the drying agent used in the controlled humidity method of air conditioning has been announced. This method uses a drying agent to absorb moisture from air directly, reducing humidity without refrigeration. It can be applied to increase the performance of existing air conditioning systems as well as to processes and industries where materials are dried or protected from atmospheric moisture. In an installation where the charge of liquid was 2000 gallons, there was no measurable consumption of liquid in 168 hours continuous operations, it was stated.

More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form on page 79, or write to us on your company stationery.

E-13. Continuous cleaning, phosphating machines

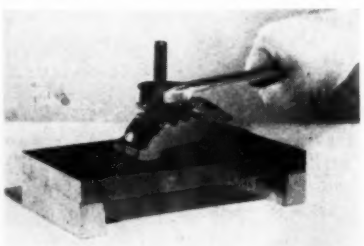


The accompanying illustration shows a spray-type processing machine for cleaning metal products. It is a 9-stage unit comprising alkali wash, sulphuric acid pickling and phosphate coating.

In this instance, 55-gallon drums are being processed, but the basic principles of this machine are said to be adaptable for the processing of any metal product prior to painting.

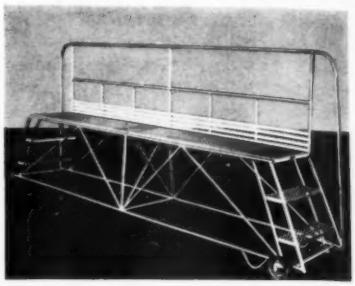
E-14. Self-setting clamps for presses and machine tools

New self-setting clamps for presses and machine tools are designed to completely eliminate packing and save setting time. The new design allows each clamp a gripping capacity to accommodate various thicknesses of bolsters.



These new clamps have been evolved to meet the requirements of any normal clamping on power and hand presses, lathes, drills, milling machines, shapers, planers, grinders, etc.

E-15. Safe footing speeds assembly, inspection and maintenance



All-steel welded tubing, expanded metal treads and platform provide safe footing and ample space for both tools and workers on portable platforms of this type. For assembling large machinery and machine tools; army tank turrets and guns, etc.; for aircraft production and maintenance; bus and truck maintenance, and many similar applications. It can also be used in place of temporary scaffolding.

E-16. Alkali-resisting primer for laundry appliance finishes

A new type of alkali-resisting primer which provides greatly increased surface protection, and effects substantial savings in labor and material, has been announced. It was developed primarily for washing machines and clothes dryers.

Two-coat finishing systems for washer and dryer exteriors employing the new primer, followed by a conventional top coat enamel, are now capable of withstanding four to ten times the exposure to alkaline washing solutions that has formerly been possible, it is reported.

E-17. Precision tool grinds and finishes metal

A new light-weight industrial tool is readily used for grinding and fin-

ishing operations on sheet metal. Cradled in palm of operator's hand, the high-speed disk grinder speedily performs jobs otherwise requiring much time and labor. The unit has wide application wherever metals are extensively used — in aircraft industry, foundry, welding, tool and die work, metal pattern work, etc.

E-18. Develop process for nickel coating aluminum

Development of a process for nickel coating aluminum, which may find many applications in industrial manufacturing, is said to solve a major problem in coating aluminum to give a stress-free, hard, yet resilient coating.

Known as "Alni-Clad," the process had been almost two years in development. Finished pieces have a semi-bright surface which can be polished chemically or mechanically to a high luster.

The process is said to be of major importance in protecting duralumin propeller blades from pitting and eroding effect of spray thrown up in sea landings and takeoffs.

E-19. Non-ferrous tube mills

After several years of experimental and test work, a machine has been developed for producing electrically welded tubing of the principal non-ferrous metals. These include practically all aluminum alloys available in coiled sheet form, copper alloys, various brasses, nickel, Monel, Inconel, and stainless steels.

The process employed produces with high weld efficiency a tube comparable in quality to conventional resistance-welded steel tubing. Welding speeds up to 50 to 90 feet per minute are practical. This is said to represent an increase of 1000% or more over previous methods of welding these alloys.

At the present time, three sizes of mills which have a total capacity range of ¾" to 8" diameter, on metal thicknesses ranging from .025" up to .140" are being offered.

Industrial literature

501. A "lesson sheet" for retail salesmen

A simplified sales training program for retail salesmen has been devised by a national organization for distribution through appliance manufacturers.

The sales training is based on the booklet "Information on Porcelain Enamel for Retail Salesmen", which is accompanied by a "lesson sheet" giving adequate information for the sales training supervisors to conduct a brief class aimed at acquainting the sales personnel with the sales features of porcelain enamel.

Interested manufacturers should write on their letterhead to *finish*, for further information.

---

502. "What's a Silicone?"

A new 32-page booklet gives the answer to the oft-repeated question "What's a Silicone?"

The booklet is classified and tabbed for easy reading, including headings such as Protective Coatings, Electrical Insulation, Defoamers, Lubricants, Release Agents, Water Repellents, and Polishes.

---

503. "Stop Paint Overspray"

A new attractively illustrated booklet is entitled "Stop Paint Overspray."

The booklet is concerned with the use of paint arrestor pads which remove overspray solids from the air exhausted from spraying areas.

These pads are designed for use in existing as well as new booths. They are currently in use in systems ranging from 300 to 112,000 cfm capacity. When the pads are filled with overspray solids, they are removed and replaced with new pads. The used pads are discarded.

---

504. "Eight things to look for" when washing metal by machine

A new booklet discusses in detail "Eight Things to Look for when You Wash Metal by Machine." The booklet describes specific materials designed for use in metal washing machines, and reviews the jobs they perform.

---

505. "ABC's of Surface Grinding"

A new 92-page booklet, entitled "The ABC's of Surface Grinding", contains information on grinding know-how, wheel selection, and trouble-shooting. It is primarily for operators of surface grinding machines.

FINISH
360 N. Michigan Ave.
Chicago 1, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No._____ **No.**_____ **No.**_____ **No.**_____

No._____ **No.**_____ **No.**_____ **No.**_____

Name _____ **Title** _____

Company _____

Company Address _____

City _____ **Zone**____ **State** _____

ADVERTISERS' INDEX

	PAGE
ACME ALUMINUM FOUNDRY CO.	7
AMERICAN CHEMICAL PAINT COMPANY	51
ARMCO STEEL CORPORATION	1
BIGELOW-GARVEY LUMBER COMPANY	ST-9
CARBORUNDUM COMPANY, THE	15
CENTURY VITREOUS ENAMEL COMPANY	19
CERAMIC COLOR & CHEMICAL MFG. CO.	2nd COVER
CHICAGO MILL AND LUMBER COMPANY	ST-4
CORNELL PAPERBOARD PRODUCTS CO.	ST-12
COWLES CHEMICAL COMPANY	17
DETREX CORPORATION	20
DETROIT BRASS AND MALLEABLE WORKS	57
DeVILBISS COMPANY, THE	18
FAHRALLOY COMPANY, THE	58
FERRO CORPORATION	16, 4th COVER
GILMAN BROTHERS COMPANY, THE	ST-16 & ST-17
HARSHAW CHEMICAL COMPANY, THE	2
HOMMEL COMPANY, THE O.	12
INGRAM-RICHARDSON, INC.	24
KIECKHEFER BOX AND LUMBER COMPANY	ST-2
KIMBERLY-CLARK CORPORATION	ST-10
MACCO PRODUCTS COMPANY	8
McDANEL REFRACTORY PORCELAIN COMPANY	11
MIDLAND INDUSTRIAL FINISHES CO.	6
MILLS ENGINEERING COMPANY	10
NAGEL-CHASE MANUFACTURING CO., THE	59
NEW MONARCH MACHINE & STAMPING CO.	42
NORTHWEST CHEMICAL COMPANY	48
OWENS-CORNING FIBERGLAS CORPORATION	52
PEMCO CORPORATION	14
RANSBURG ELECTRO-COATING CORP.	53
RATHBORNE, HAIR & RIDGWAY BOX CO.	ST-13
REPUBLIC STEEL CORPORATION	4
ROBERTSHAW-FULTON CONTROLS COMPANY	54
SHERWIN-WILLIAMS CO., THE	46
TINNERMAN PRODUCTS, INC.	9
TITANIUM PIGMENT CORPORATION	5
UNION STEEL PRODUCTS CO.	3rd COVER
VERSON ALLSTEEL PRESS COMPANY	32
WATKINS CONTAINER MANUFACTURERS	ST-14
WEBB COMPANY, JERVIS B.	55
YODER COMPANY, THE	56

SALES & CUSTOMER SERVICE
JACK BAIN — 545 FIFTH AVE., NEW YORK CITY
360 N. MICHIGAN AVE., CHICAGO 1, ILL.

"I saw your ad in finish"

ING-RICH REELECTS DIRECTORS

Shareholders of Ingram-Richardson, Inc. have reelected the following directors: Raymond H. Coin, Clifford P. Scripture, Roscoe S. Dukes, J. Fred Ingram, and Hugh McE. Patton.

The following officers were elected: R. H. Coin, president; C. P. Scripture, vice pres.; R. S. Dukes, vice pres.; M. J. Keedy, vice pres.-sales; C. R. Wainscott, vice pres.-mfg.; R. D. Ticen, treasurer; R. A. Keedy, secretary; R. D. Thayer, factory supt.; J. T. Hewlett, manager, frit sales and service.

KALAMAZOO STOVE, MAREMONT AUTOMOTIVE MERGER PLANNED

Stockholders of Maremont Automotive Products, Inc., Chicago, and Kalamazoo Stove & Furnace Co. were scheduled to vote on April 25 on a proposed merger into one company known as Kalamazoo-Maremont Mfg.

DEVILBISS ADVANCES KIDD

Appointment of Henry M. Kidd as vice president and sales manager of

the spray painting equipment division of The DeVilbiss Company has been announced by Howard P. DeVilbiss, president.

Kidd has been associated with DeVilbiss for more than 18 years. He was named assistant sales manager in 1944. In October, 1950, he was appointed sales manager of the division. During his tenure with the firm, spray painting equipment sales have increased, with the highest dollar volume reached last year.